THE VETERINARY BULLETIN

1955

VOLUME XXV

COMMONWEALTH BUREAU OF ANIMAL HEALTH
WEYBRIDGE, SURREY
ENGLAND

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Director, Veterinary Laboratory, Ministry of Agriculture and Fisheries, Weybridge.

Vol. 25. No. 1. pp. 1-44
Abstracts 1-265

January, 1955

THE VETERINARY BULLETIN

COMPILED FROM WORLD LITERATURE

Prepared by the
COMMONWEALTH BUREAU OF ANIMAL HEALTH
WEYBRIDGE, SURREY
ENGLAND

Published by the
COMMONWEALTH AGRICULTURAL BUREAUX
FARNHAM ROYAL, ENGLAND

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ABBREVIATIONS OF NAMES OF PUBLICATIONS

The abbreviations used in *Index Veterinarius* and *The Veterinary Bulletin* are those of the *World List of Scientific Periodicals published in the years* 1900-1950, 3rd Edit. (1952). London: Butterworths Scientific Publications.

List of Abbreviations

A.I. — artificial insemination
ant. — anterior
A.P.F. — animal protein factor
approx. — approximately
aq. — aqueous
av. — average

B.A.L. — British anti Lewisite (2,3 dimercaptopropanol)
b.p. — boiling point

c.f. — complement fixation
clin. — clinical
coeff. — coefficient
conc. — concentration
c.s.f. — cerebrospinal fluid

diam. — diameter
dil. — dilute(d)
diln. — dilution

E.I.A. — equine infectious anaemia
equiv. — equivalent

ft. — foot (feet) [measurement only]

Hb. — haemoglobin
H.I. — haemagglutination inhibition

inj. — injection(s)
insol. — insoluble
Inst. (inst) — Institute
i/m — intramuscular(ly)
i/p — intraperitoneal(ly)
i/v — intravenous(ly)
i/d — intradermal(ly)

lab. — laboratory (-ories)

max. — maximum (-al)

N.D.V. — Newcastle disease virus
N.D. — Newcastle disease

r.b.c. — red blood corpuscles
r.e.s. — reticuloendothelial system
R.H. — relative humidity

s/c — subcutaneous(ly)
soln. — solution
suppl. — supplement(s) (-ary)
std. — standard

temp. — temperature
therap. — therapeutic

U.V. — ultra-violet

vet. — veterinary
vol. — volume

w.b.c. — white blood corpuscles
wt. — weight

/ — per (*e.g.* wt./vol.; mg./lb. body wt.)

The Executive Council of the Commonwealth Agricultural Bureaux is a signatory to the Fair Copying Declaration, details of which can be obtained from the Royal Society, Burlington House, London, W.1.

Bulletins on disease subjects written for farmers and "popular" articles of a similar nature are not included in the *Veterinary Bulletin*. Those of a sufficiently important nature are, however, included in *Index Veterinarius*; so also are certain review articles, presidential addresses, congress proceedings, etc., where the title conveys as much information as could be given in an abstract of a few lines. For information of this nature, readers of the *Veterinary Bulletin* are referred to *Index Veterinarius*, where titles of all publications indexed by the bureau are fully cross-referenced.

A list of annotations and reviews, classified according to subject, is now given in *Index Veterinarius*, being inserted at the end of each number. Such papers will not necessarily be dealt with in the *Veterinary Bulletin*.

The Editor will be glad to receive publications relating to Veterinary Science and cognate subjects in order that they may be dealt with in the *Veterinary Bulletin*.

Reports of Departments, Special Reports, reprints, etc., etc., should be sent as soon as they are issued.

Books for Review.

The Editor will be glad to receive books for review in the *Veterinary Bulletin*.

LIST OF PUBLICATIONS SEARCHED BY COMMONWEALTH BUREAU OF ANIMAL HEALTH

(a) JOURNALS

Title	*Abbreviation*
Acta Allergologica. Denmark.	*Acta allerg., Kbh.*
Acta Endocrinologica. Denmark.	*Acta endocr., Copenhagen.*
Acta Medica Scandinavica. Sweden.	*Acta med. scand.*
Acta Microbiologica. Poland	*Acta microbiol. polon.*
Acta Pathologica et Microbiologica Scandinavica. Denmark.	*Acta path. microbiol. scand.*
Acta Tropica. Switzerland.	*Acta trop., Basel.*
Acta Tuberculosea Scandinavica. Denmark.	*Acta tuberc. scand.*
Acta Veterinaria. Yugoslavia.	*Acta vet., Belgrade.*
Acta Veterinaria. Academiae Scientiarum Hungaricae. Hungary.	*Acta vet., hung.*
Advancement of Science. Great Britain.	*Advanc. Sci., Lond.*
Agricultural Chemicals. U.S.A.	*Agric. Chemic.*
Agricultural Gazette of New South Wales. Australia.	*Agric. Gaz. N.S.W.*
Agricultural Institute Review. Canada.	*Agric. Inst. Rev.*
Agricultural Journal. Colony of Fiji.	*Agric. J., Fiji.*
Agricultural Progress. Great Britain.	*Agric. Progr.*
Agriculture. Great Britain.	*Agriculture, Lond.*
Agriculture and Animal Husbandry. India.	*Agric. Anim. Husb. India.*
Agronomia y Veterinaria. Argentina.	*Agron. y Vet.*
Allied Veterinarian. U.S.A.	*Allied Vet.*
American Fur Breeder. U.S.A.	*Amer. Fur Breeder.*
American Journal of Anatomy. U.S.A.	*Amer. J. Anat.*
American Journal of Clinical Pathology. U.S.A.	*Amer. J. clin. Path.*
American Journal of Hygiene. U.S.A.	*Amer. J. Hyg.*
American Journal of Medical Sciences. U.S.A.	*Amer. J. med. Sci.*
American Journal of Pathology. U.S.A.	*Amer. J. Path.*
American Journal of Physiology. U.S.A.	*Amer. J. Physiol.*
American Journal of Public Health. U.S.A.	*Amer. J. publ. Hlth.*
American Journal of Tropical Medicine and Hygiene. U.S.A.	*Amer. J. trop. Med. Hyg.*
American Journal of Veterinary Research. U.S.A.	*Amer. J. vet. Res.*
American Review of Tuberculosis. U.S.A.	*Amer. Rev. Tuberc.*
Anales de la Facultad de Veterinaria. Uruguay.	*An. Fac. Vet. Montevideo.*
Anales de la Facultad de Veterinaria de la Universidad de Madrid. Spain.	*An. Fac. Vet. Madrid.*
Anales del Instituto de Higiene de Montevideo. Uruguay.	*An. Inst. Hig. Montevideo.*
Analyst. Great Britain.	*Analyst.*
Analytical Abstracts. Great Britain.	*Analyt. Abstr.*
Anatomical Record. U.S.A.	*Anat. Rec.*
Animal Breeding Abstracts. Great Britain.	*Anim. Breed. Abstr.*
Annales de l'Institut Pasteur. France.	*Ann. Inst. Pasteur.*
Annales de l'Institut Pasteur de Lille. France.	*Ann. Inst. Pasteur Lille.*
Annales de Médecine Vétérinaire. Belgium.	*Ann. Méd. vét.*
Annales de Parasitologie Humaine et Comparée. France.	*Ann. Parasit. hum. comp.*
Annales de la Société Belge de Médicine Tropicale. Belgium.	*Ann. Soc. belge Méd. trop.*
Annales Universitatis Mariae Curie-Skłodowska. Section DD. Poland.	*Ann. Univ. M. Curie-Skłodowska.*
Annali della Facoltà di Medicina Veterinaria. Università di Pisa. Italy.	*Ann. Fac. Med. vet. Pisa.*
Annals of Applied Biology. Great Britain.	*Ann. appl. Biol.*
Annals of the New York Academy of Sciences. U.S.A.	*Ann. N.Y. Acad. Sci.*
Annals of Tropical Medicine and Parasitology. Great Britain.	*Ann. trop. Med. Parasit.*
Antibiotics & Chemotherapy. U.S.A.	*Antibiot. & Chemotherap.*
Antonie van Leeuwenhoek. Journal of Microbiology and Serology. Netherlands.	*Leeuwenhoek ned. Tijdschr.*
Applied Microbiology. U.S.A.	*Appl. Microbiol.*
Araneta Journal of Agriculture. Philippines.	*Araneta J. Agric.*
Archiv für Experimentelle Veterinärmedizin. Germany.	*Arch. exp. VetMed.*
Archiv für Geflügelkunde. Germany.	*Arch. Geflügelk.*
Archiv für die Gesamte Virusforschung. Austria.	*Arch. ges. Virusforsch.*
Archives of Biochemistry and Biophysics. U.S.A.	*Arch. Biochem.*
Archives de l'Institut d'Hessarek. Iran.	*Arch. Inst. Hessarek.*
Archives de l'Institut Pasteur d'Algérie. Algeria.	*Arch. Inst. Pasteur Algér.*
Archives de l'Institut Pasteur du Maroc. Morocco.	*Arch. Inst. Pasteur Maroc.*
Archives of Pathology. U.S.A.	*Arch. Path.*
Archivio Veterinario Italiano. Italy.	*Arch. Vet. Ital.*
Arquivos do Instituto Bacteriológico Câmera Pestana. Portugal.	*Arch. Inst. bact. Cam. Pest.*
Archivos de Veterinaria Practica. Spain.	*Arch. vet. Pract., Corunna.*
Archivos de Zootecnia. Spain.	*Arch. Zootec., Cordoba.*

Title	*Abbreviation*
Arquivos de Biologia e Tecnologia. Brazil.	*Arch. Biol., Curitiba.*
Arquivos da Escola Superior de Veterinária do Estado de Minas Gerais. Brazil.	*Arch. Esc. Vet. Minas Gerais.*
Arquivos do Instituto Biologico. Departmento de Defesa Sanitária da Agricultura. Brazil.	*Arch. Inst. biol. (Def. agric. anim.), S. Paulo.*
Askerî Veteriner Dergisi. Turkey.	*Ask. vet. Derg.*
Atti della Società Italiana delle Scienze Veterinarie. Italy.	*Atti Soc. ital. Sci. vet.*
Auburn Veterinarian. U.S.A.	*Auburn Vet.*
Australian Journal of Agricultural Research. Australia.	*Aust. J. agric. Res.*
Australian Journal of Applied Science. Australia.	*Aust. J. appl. Sci.*
Australian Journal of Biological Sciences. Australia.	*Aust. J. biol. Sci.*
Australian Journal of Dairy Technology. Australia.	*Aust. J. Dairy Tech.*
Australian Journal of Experimental Biology and Medical Science. Australia.	*Aust. J. exp. Biol. med. Sci.*
Australian Journal of Science. Australia.	*Aust. J. Sci.*
Australian Journal of Zoology. Australia.	*Aust. J. Zool.*
Australian Veterinary Journal. Australia.	*Aust. vet. J.*
Bacteriological Reviews. U.S.A.	*Bact. Rev.*
Berliner und Münchener Tierärztliche Wochenschrift. Germany.	*Berl. Münch. tierärztl. Wschr.*
Bibliography of Agriculture. U.S.A.	*Bibliogr. Agric. U.S. Dep. Agric.*
Biochemical Journal. Great Britain.	*Biochem. J.*
Biological Abstracts. U.S.A.	*Biol. Abstr.*
Biological Reviews of the Cambridge Philosophical Society. Great Britain.	*Biol. Rev.*
Biológico. Brazil.	*Biológico.*
Biometrics. U.S.A.	*Biometrics.*
Blood. The Journal of Haematology. U.S.A.	*Blood.*
Boletim da Directoria da Producão Animal. Brazil.	*Bol. Diret. Prod. anim., Porto Alegre.*
Boletim de Indústria Animal. Brazil.	*Bol. Industr. anim.*
Boletim de Inseminação Artificial. Brazil.	*Bol. Insem. art.*
Boletim do Instituto Vital Brasil. Brazil.	*Bol. Inst. Vital Brazil.*
Boletim Pecúario. Portugal.	*Bol. pecuar.*
Boletim da Sociedade Brasiliera de Medicina Veterinaria. Brazil.	*Bol. Soc. bras. Med. vet.*
Boletim da Sociedade Paulista de Medicine Veterinaria. Brazil.	*Bol. Soc. paul. Med. vet.*
Boletin del Centro de Documentation Cientifica y Technica. Brazil.	*Bol. Cent. Doc., Mexico.*
Boletin de Información. Consejo General de Colegios Veterinarios de España. Spain.	*Bol. Cons. Col. vet. Esp.*
Boletin de Informacion. Supplemento Cientifico. Spain.	*Bol. Cons. Col. vet. Esp. Suppl. cient.*
Boletin de Instituto de Investigaciones Veterinarias. Venezuela.	*Bol. Inst. Invest vet. Caracas.*
Boletin Mensual. Dirección de Ganadería. Uruguay.	*Bol. Direcc. Ganad., Montevideo.*
Boletin de la Oficina Sanitara Panamericana. U.S.A.	*Bol. Ofic. sanit. pan-amer.*
Boletín de Zootecnia. Spain.	*Bol. Zootec., Cordoba.*
Bolletino dell'Instituto Sieroterapico Milanese. Italy.	*Bol. Ist. sieroter. Milano.*
Bolletino della Società Italiana de Biologia Sperimentale. Italy.	*Bol. Soc. ital. Biol. sper.*
Bombay Veterinary College Magazine. India.	*Bombay Vet. Coll. Mag.*
Bourgelat. France.	*Bourgelat.*
British Abstracts of Medical Sciences. Great Britain.	*Brit. Abstr. med. Sci.*
British Agricultural Bulletin. Great Britain.	*Brit. agric. Bull.*
British Journal of Animal Behaviour. (Formerly Bulletin of Animal Behaviour.) Great Britain.	*Brit. J. Anim. Behav.*
British Journal of Experimental Pathology. Great Britain.	*Brit. J. exp. Path.*
British Journal of Nutrition. Great Britain.	*Brit. J. Nutr.*
British Journal of Pharmacology and Chemotherapy. Great Britain.	*Brit. J. Pharmacol.*
British Journal of Tuberculosis. Great Britain.	*Brit. J. Tuberc.*
British Medical Bulletin. Great Britain.	*Brit. med. Bull.*
British Medical Journal. Great Britain.	*Brit. med. J.*
British Veterinary Journal. Great Britain.	*Brit. vet. J.*
Bulletin de l'Académie Nationale de Médecine. France.	*Bull. Acad. nat. Méd.*
Bulletin de l'Academie Polonaise des Sciences. Classe Deuxième. Poland.	*Bull. Acad. polon. Sci. Cl. II.*
Bulletin de l'Académie Vétérinaire de France. France.	*Bull. Acad. vét. Fr.*
Bulletin Agricole. Madagascar.	*Bull. agric., Tananarive.*
Bulletin Agricole du Congo Belge. Belgian Congo.	*Bull. agric. Congo belge.*
Bulletin Bibliographique. Bureau Permanent Interafricain de la Tsé-Tsé et de la Trypanosomiase. Belgian Congo.	*Bull. Bibliogr. Bur. interafr. Tsé-Tsé.*
Bulletin of the Department of Agriculture. State of California. U.S.A.	*Bull. Calif. Dep. Agric.*

Title	Abbreviation
Bulletin of Entomological Research. Great Britain.	*Bull. ent. Res.*
Bulletin of Epizootic Diseases of Africa. Kenya.	*Bull. epiz. Dis. Afr.*
Bulletin of Hygiene. Great Britain.	*Bull. Hyg., Lond.*
Bulletin de l'Institut Pasteur. France.	*Bull. Inst. Pasteur.*
Bulletin of the Johns Hopkins Hospital. See Johns Hopkins Hospital Bulletin.	
Bulletin Mensule de la Société Vétérinaire Pratique de France. France.	*Bull. Soc. vét. prat. Fr.*
Bulletin de Microscopie Appliquée. France.	*Bull. Micr. appl.*
Bulletin of the National Institute of Agricultural Sciences. Series G. Japan.	*Bull. Nat. Inst. agric. Sci., Japan.*
Bulletin of the Naniwa University. Series B. Japan.	*Bull. Naniwa Univ.*
Bulletin of the New York Academy of Medicine. U.S.A.	*Bull. N.Y. Acad. Med.*
Bulletin. Office International de Epizooties. France.	*Bull. Off. int. Epiz.*
(Bulletin.) Office International de Epizooties. Statistiques. France.	
Bulletin Signalétique d'Entomologie Médicale et Vétérinaire. France.	*Bull. signal. Ent. méd. vét.*
Bulletin de la Société de Pathologie Exotique et de ses Filiales. France.	*Bull. Soc. Pat. exot.*
Bulletin de la Société de Sciences Vétérinaires de Lyon. France.	*Bull. Soc. Sci. vét. Lyon.*
Bulletin de la Société Vétérinaire Hellénique. Greece.	*Delt. Hellen. kten. Hetair.*
Bulletin. State of California Department of Agriculture. *See* Bulletin of the Department of Agriculture. State of California.	
Bulletin du Syndicat National des Vétérinaires. France.	*Bull. Synd. nat. Vét.*
Bulletin Vétérinaire d'Algérie. Algeria.	*Bull. vet. Algér.*
Bulletin of the World Health Organization. Switzerland.	*Bull. World Hlth Org.*
Les Cahiers de Médecine Vétérinaire. France.	*Cah. Méd. vét.*
California Veterinarian. U.S.A.	*Calif. Vet.*
Canadian Journal of Agricultural Science. (*Formerly* Scientific Agriculture.) Canada.	*Canad. J. agric. Sci.*
Canadian Journal of Biochemstry and Physiology. Canada.	*Canad. J. Biochem. Physiol.*
Canadian Journal of Chemistry. Canada.	*Canad. J. Chem.*
Canadian Journal of Comparative Medicine and Veterinary Science. Canada.	*Canad. J. comp. Med.*
Canadian Journal of Microbiology. Canada.	*Canad. J. Microbiol.*
Canadian Journal of Public Health. Canada.	*Canad. J. publ. Hlth.*
Canadian Journal of Technology. Canada.	*Canad. J. Technol.*
Canadian Journal of Zoology. Canada.	*Canad. J. Zool.*
Canadian Medical Association Journal. Canada.	*Canad. med. Ass. J.*
Cancer Research. U.S.A.	*Cancer Res.*
Ceres. Brazil. See Revista Ceres.	
Ceylon Veterinary Journal. Ceylon.	*Ceylon vet. J.*
Ceylon Veterinary Services Reporter. Ceylon.	*Reporter, Ceylon.*
Chemical Reviews. U.S.A.	*Chem. Rev.*
Chinese Medical Journal. China.	*Chin. med. J.*
Chronicle of the World Health Organization. Switzerland.	*Chron. World Hlth Org.*
Ciencia Veterinaria (Boletin). Spain.	*Cienc. vet.*
Ciencia Veterinaria. (Revista.) Spain.	*Cienc. vet.*
Clinica Veterinaria. Italy.	*Clin. vet., Milano.*
Colonial Development. Great Britain	*Colon. Developm.*
Colonial Plant and Animal Products. Great Britain.	*Colon. Pl. Anim. Prod.*
Comptes Rendus de l'Academie d'Agriculture. France.	*C. R. Acad. Agric. Fr.*
Comptes Rendus Hebdomadaires des Séances de l'Academie des Sciences. France.	*C. R. Acad. Sci., Paris.*
Comptes Rendus de l'Academie Bulgare des Sciences. Bulgaria.	*C. R. Acad. bulg. Sci.*
Comptes Rendus de l'Academie des Sciences de l'U.R.S.S. *See* Doklady Akademii Nauk SSSR.	
Comptes Rendus des Séances de la Société de Biologie et des ses Filiales. France.	*C. R. Soc. Biol., Paris.*
Conquest. The Journal of the Research Defence Society. (*Formerly* Fight Against Disease.) Great Britain.	*Conquest.*
Cornell Veterinarian. U.S.A.	*Cornell Vet.*
Current Science. India.	*Curr. Sci.*
Dairy Science Abstracts. Great Britain.	*Dairy Sci. Abstr.*
Dansk Maanedsskrift for Dyrlaeger. Denmark.	*Dansk Maanedskr. Dyrlaeg.*
Deutsche Tierärztliche Wochenschrift. Germany.	*Dtsch. tierärztl. Wschr.*
Documenta de Medicina Geographica et Tropica. Netherlands.	*Docum. Med. geogr. trop.*
Doklady Akademii Nauk SSSR. U.S.S.R.	*C. R. Acad. Sci. U.R.S.S.*
East African Agricultural Journal. Kenya.	*E. Afr. agric. J.*

Title	Abbreviation
East African Medical Journal. Kenya.	*E. Afr. med. J.*
Edinburgh Medical Journal. Great Britain.	*Edinb. med. J.*
Empire Journal of Experimental Agriculture. Great Britain.	*Emp. J. exp. Agric.*
Encyclopédie Vétérinaire Periodique. France.	*Encycl. vét.*
Endeavour. Great Britain.	*Endeavour.*
Endocrinology. U.S.A.	*Endocrinology.*
Enzymologia. Acta Biocatalytica. Netherlands.	*Enzymologia.*
Ergebnisse der Hygiene, Bakteriologie, Immunitätsforschung und Experimentelle Therapie. Germany.	*Ergebn. Hyg. Bakt.*
Excerpta Medica. Sections I-V. Netherlands.	*Excerpta med. Amst.*
Experimental Parasitology. U.S.A.	*Exp. Parasit.*
Farming in South Africa. Union of South Africa.	*Fmg S. Afr.*
Federal Veterinarian. U.S.A.	*Fed. Vet.*
Federation Proceedings. U.S.A.	*Fed. Proc.*
Fertility and Sterility. U.S.A.	*Fertil. & Steril.*
Finsk Veterinärtidskrift. *See* Suomen Eläinlääkärilehti.	
Food and Agriculture. The F.A.O. European Bulletin. Italy.	*Food & Agric., Rome.*
Food Science Abstracts. Great Britain.	*Food Sci. Abstr.*
Fortpflanzung, Zuchthygiene und Haustierbesamung. (Supplement to Dtsch. tierärztl. Wschr.) Germany.	*Fortpflanzung.*
Frankfurter Zeitschrift für Pathologie. Germany.	*Frankfurt Z. Path.*
Gaceta Veterinaria. Argentina.	*Gac. vet., B. Aires.*
Gazzetta Veterinaria. Italy.	*Gazz. Vet., Milano.*
Giornale di Batteriologia e Immunologia. Italy.	*G. Batt. Immun.*
Growth. U.S.A.	*Growth.*
Harefuah. Israel.	*Harefuah.*
Health. Journal of the Commonwealth Department of Health. Australia.	*Health, Canberra.*
Helminthological Abstracts. Great Britain.	*Helminth Abstr.*
Hemera Zoa. Indonesia.	*Hemera Zoa.*
Herbage Abstracts. Great Britain.	*Herb. Abstr.*
Heredity. Great Britain.	*Heredity.*
Hoppe-Seyler's Zeitschrift für Physiologische Chemie. Germany.	*Hoppe-Seyl. Z.*
Indian Farming. India.	*Indian Fmg.*
Indian Journal of Dairy Science. India.	*Indian J. Dairy Sci.*
Indian Journal of Malariology. India.	*Indian J. Malar.*
Indian Journal of Medical Research. India.	*Indian J. med. Res.*
Indian Journal of Veterinary Science and Animal Husbandry. India.	*Indian J. vet. Sci.*
Indian Medical Gazette. India.	*Indian med. Gaz.*
Indian Veterinary Journal. India.	*Indian vet J.*
International Bulletin of Bacteriological Nomenclature and Taxonomy. U.S.A.	*Int. Bull. bact. Nom. Taxon.*
Internationale Zeitschrift für Vitaminforschung. Switzerland.	*Int. Z. Vitaminforsch.*
Iowa State College Veterinarian. U.S.A.	*Iowa St. Coll. Vet.*
Iowa Veterinarian. U.S.A.	*Iowa Vet.*
Irish Veterinary Journal. Republic of Ireland.	*Irish vet. J.*
Japanese Journal of Experimental Medicine. Japan.	*Jap J. exp. Med.*
Japanese Journal of Veterinary Science. Japan.	*Jap. J. vet. Sci.*
Jen-Sal Journal. U.S.A.	*Jensal. J.*
Johns Hopkins Hospital Bulletin. U.S.A.	*Johns Hopk. Hosp. Bull.*
Jornal de Ciências Veterinárias. Portugal.	*J. Ciênc. vet. Lisboa.*
Journal of Agricultural Science. Great Britain.	*J. agric. Sci.*
Journal of the American Medical Association. U.S.A.	*J. Amer. med. Ass.*
Journal of the American Veterinary Medical Association. U.S.A.	*J. Amer. vet. med. Ass.*
Journal of Anatomy. Great Britain.	*J. Anat., Lond.*
Journal of Animal Ecology. Great Britain.	*J. Anim. Ecol.*
Journal of Animal Science. U.S.A.	*J. Anim. Sci.*
Journal of the Australian Institute of Agricultural Science. Australia.	*J. Aust. Inst. agric. Sci.*
Journal of Bacteriology. U.S.A.	*J. Bact.*
Journal of Biological Chemistry. U.S.A.	*J. biol. Chem.*
Journal of the Chemical Society. Great Britain.	*J. chem. Soc.*
Journal of Clinical Investigation. U.S.A.	*J. clin. Invest.*
Journal of Comparative Pathology and Therapeutics. Great Britain.	*J. comp. Path.*
Journal of Dairy Research. Great Britain.	*J. Dairy Res.*
Journal of Dairy Science. U.S.A.	*J. Dairy Sci.*
Journal of the Department of Agriculture. Republic of Ireland.	*J. Dep. Agric. Irish Free St.*
Journal of the Department of Agriculture of South Australia. Australia.	*J. Dep. Agric. S. Aust.*
Journal of the Department of Agriculture, Victoria. Australia.	*J. Dep. Agric. Vict.*

Title	*Abbreviation*
Journal of the Department of Agriculture, Western Australia. Australia.	*J. Dep. Agric. W. Aust.*
Journal of Economic Entomology. U.S.A	*J. econ. Ent.*
Journal of Endocrinology. Great Britain.	*J. Endocrin.*
Journal of the Entomological Society of Southern Africa. Union of South Africa.	*J ent. Soc. S. Afr.*
Journal of Experimental Biology. Great Britain.	*J. exp. Biol.*
Journal of Experimental Medicine. U.S.A.	*J. exp. Med.*
Journal of the Farmers' Club. Great Britain.	*J. Fmrs' Cl., Lond.*
Journal of General Microbiology. Great Britain.	*J. gen. Microbiol.*
Journal of General Physiology. U.S.A.	*J. gen. Physiol.*
Journal of Genetics. Great Britain.	*J. Genet.*
Journal of Helminthology. Great Britain.	*J. Helminth.*
Journal of Heredity. U.S.A.	*J. Hered.*
Journal of Hygiene. Great Britain.	*J. Hyg., Camb.*
Journal of Immunology. U.S.A.	*J. Immunol.*
Journal of Infectious Diseases. U.S.A.	*J. infect. Dis.*
Journal of the Japan Veterinary Medical Association. Japan.	*J. Jap. vet. med. Ass.*
Journal of Laboratory and Clinical Medicine. U.S.A.	*J. Lab. clin. Med.*
Journal of Medical Laboratory Technology. Great Britain.	*J. med. Lab. Tech.*
Journal of Milk and Food Technology. U.S.A.	*J. Milk Tech.*
Journal of Morphology. U.S.A.	*J. Morph.*
Journal of the National Cancer Institute. U.S.A.	*J. nat. Cancer Inst.*
Journal of Nutrition. U.S.A.	*J. Nutr.*
Journal of Parasitology. U.S.A.	*J. Parasit.*
Journal of Pathology and Bacteriology. Great Britain.	*J. Path. Bact.*
Journal of Pharmacology and Experimental Therapeutics. U.S.A.	*J. Pharmacol.*
Journal of Physiology. Great Britain.	*J. Physiol.*
Journal of Protozoology. U.S.A.	*J. Prot.*
Journal of Royal Agricultural Society of England. Great Britain.	*J. R. agric. Soc.*
Journal of the Royal Army Veterinary Corps. Great Britain.	*J. R. Army vet. Cps.*
Journal of the Royal Institute of Public Health and Hygiene. Great Britain.	*J. R. Inst. publ. Hlth.*
Journal of the Royal Microscopical Society. Great Britain.	*J. R. micr. Soc.*
Journal and Proceedings of the Royal Society of New South Wales. Australia.	*J. roy. Soc. N.S.W.*
Journal of the Royal Society of Western Australia. Australia.	*J. roy. Soc. W. Aust*
Journal of the Science of Food and Agriculture. Great Britain.	*J. Sci. Fd Agric.*
Journal of the South African Veterinary Medical Association. Union of South Africa.	*J. S. Afr. vet. med. Ass.*
Journal of Tropical Medicine and Hygiene. Great Britain.	*J. trop. Med. (Hyg.)*
Journal of the Veterinary Association of Thailand. Thailand.	*J. vet. Ass. Thailand.*
Journal of Wildlife Management. U.S.A.	*J. Wildlife Mgmt.*
Kitasato Archives of Experimental Medicine. Japan.	*Kitasato Arch.*
Laboratory Animals Bulletin. Great Britain.	*Lab. Anim. Bull.*
Laboratory Investigation. U.S.A.	*Lab. Invest.*
Laboratory Practice. Great Britain.	*Lab. Pract.*
Lait. France.	*Lait.*
Lancet. Great Britain.	*Lancet.*
Lebensmitteltierarzt. Germany.	*Lebensmitteltierarzt.*
List of Scientific Papers Published in the Middle East. (Liste des Travaux Scientifiques Publiés au Moyen Orient.) Egypt.	*List. sci. Pap. Middle-East.*
Maataloustieteelinen Aikakauskirja. Finland.	*Maataloust. Aikakausk.*
Madras Veterinary College Annual. India.	*Madras vet. Coll. Annual.*
Magyar Állatorvosok Lapja. Hungary.	*Mag. állator. Lapja.*
Malayan Agricultural Journal. Malaya.	*Malay. agric. J.*
Manx Journal of Agriculture. Great Britain.	*Manx J. agric.*
Maroc Médical. Morocco.	*Maroc méd.*
Medical and Biological Illustration. Great Britain.	*Med. Biol. Illustr.*
Medical Journal of Australia. Australia.	*Med. J. Aust.*
Medical Officer. Great Britain.	*Med. Offr.*
Medicine. U.S.A.	*Medicine, Baltimore.*
Medlemsblad for den Danske Dyrlaegeforening. Denmark.	*Medlemsbl. danske Dyrlaegeforen.*
Medlemsblad för Sveriges Veterinärförbund. Sweden.	*Medlemsbl. sveriges VetFbd.*
Medycyna Weternaryjna. Poland.	*Méd. vét., Varsovie.*
Memorias do Instituto Butantan. Brazil.	*Mem. Inst. Butantan.*
Memorias do Instituto Oswaldo Cruz. Brazil.	*Mem. Inst. Osw. Cruz.*
Merck Report. U.S.A.	*Merck's Rep.*
Michigan State College Veterinarian. U.S.A.	*Mich. St. Coll. Vet.*
Mikrobiologiya. U.S.S.R.	*Microbiology, Moscow.*
Milchwissenschaft. Germany.	*Milchwissenschaft.*
Monatshefte für Tierheilkunde. Germany.	*Mh. Tierheilk.*

Title	*Abbreviation*
Monatshefte für Veterinärmedizin. Germany.	*Mh. VetMed.*
Monthly Bulletin of the Ministry of Health and the Public Health Laboratory Service. Great Britain.	*Mon. Bull. Minist. Hlth Lab. Serv.*
Mycopathologia et Mycologia Applicata. Netherlands.	*Mycopathologia.*
National Agricultural Advisory Service Quarterly Review. Great Britain.	*N.A.A.S. quart Rev.*
National Association for the Prevention of Tuberculosis Bulletin. Great Britain.	*N.A.P.T. Bull.*
National Research Council Research News. Canada.	*N.R.C. Res. News.*
Nature. Great Britain.	*Nature, Lond.*
New Zealand Journal of Agriculture. New Zealand.	*N.Z. J. Agric.*
New Zealand Journal of Science and Technology. Section A. Agricultural Research. Section B. General. New Zealand.	*N.Z. J. Sci. Tech.*
New Zealand Medical Journal. New Zealand.	*N.Z. med. J.*
New Zealand Veterinary Journal. New Zealand.	*N.Z. vet. J.*
Nordisk Veterinärmedicin. Denmark.	*Nord. VetMed.*
North American Veterinarian. U.S.A.	*N. Amer. Vet.*
Nuova Veterinaria. Italy.	*Nuova Vet.*
Nutrition Abstracts and Reviews. Great Britain.	*Nutr. Abstr. Rev.*
Nutrition Reviews. U.S.A.	*Nutr. Rev.*
Onderstepoort Journal of Veterinary Research. Union of South Africa.	*Onderstepoort J. vet. Res.*
Pakistan Journal of Health. Pakistan.	*Pakist. J. Hlth.*
Pakistan Journal of Science. Pakistan.	*Pakist. J. Sci.*
Pakistan Journal of Scientific Research. Pakistan.	*Pakist. J. sci. Res.*
Papua & New Guinea Agricultural Gazette. Papua and New Guinea.	*Papua agric. Gaz.*
Parasitology. Great Britain.	*Parasitology.*
Pastoral Review and Graziers' Record. Australia.	*Pastoral Rev.*
Pecuária. Anais dos Servicos Veterinária e Indústria Animal. Angola, Portuguese West Africa.	*Pecuária.*
Pflüger's Archiv für die Gesamte Physiologie des Menschen und der Tiere. Germany.	*Pflüg. Arch. ges. Physiol.*
Pharmacological Reviews. U.S.A.	*Pharmacol. Rev.*
Philippine Journal of Animal Industry. Philippines.	*Philipp. J. Anim. Ind.*
Philippine Journal of Science. Philippines.	*Philipp. J. Sci.*
Philosophical Transactions of the Royal Society. Series B. Great Britain.	*Phil. Trans. Ser. B.*
Physiologia Comparata et Oecologia. Netherlands.	*Physiol. comp.*
Physiological Reviews. U.S.A.	*Physiol. Rev.*
Poultry Science. U.S.A.	*Poult. Sci.*
Praktische Tierarzt. Germany.	*Prakt. Tierarzt.*
Presse Médicale. France.	*Pr. méd.*
Proceedings of the American Association for Cancer Research. U.S.A.	*Proc. Amer. Ass. Cancer Res.*
Proceedings of the Entomological Society of British Columbia. Canada.	*Proc. ent. Soc. B.C.*
Proceedings of the Helminthological Society of Washington. U.S.A.	*Proc. helm. Soc. Wash.*
Proceedings. Koninklijke Nederlandse Akademie van Wetenschappen. Series C. Netherlands.	*Proc. Acad. Sci. Amst.*
Proceedings of the Nutrition Society. Great Britain.	*Proc. Nutr. Soc.*
Proceedings of the Royal Society. Series B. Great Britain.	*Proc. roy. Soc. Ser. B.*
Proceedings of the Royal Society of Medicine. Great Britain.	*Proc. R. Soc. Med.*
Proceedings of the Royal Society of Queensland. Australia.	*Proc. roy. Soc. Qd.*
Proceedings of the Royal Society of Victoria. Australia.	*Proc. Roy. Soc. Vict.*
Proceedings of the Society for Experimental Biology and Medicine.. U.S.A.	*Proc. Soc. exp. Biol., N.Y.*
Profilassi. Italy.	*Profilassi.*
Progress. Great Britain.	*Progress, Lond.*
Progresso Veterinario. Italy.	*Progr. vet., Torino.*
Pubblicazioni. Facoltà di Medicina Veterinaria, Università degli Studi di Perugia. Italy.	*Pubbl. Fac. Med. vet. Perugia.*
Public Health. Reports. U.S.A.	*Publ. Hlth Rep., Wash.*
Quarterly Journal of Experimental Physiology. Great Britain.	*Quart. J. exp. Physiol.*
Quarterly Journal of Microscopical Science. Great Britain.	*Quart. J. micr. Sci.*
Queensland Agricultural Journal. Australia.	*Qd agric. J.*
Queensland Journal of Agricultural Science. Australia.	*Qd J. agric. Sci.*
Radiation Research. U.S.A.	*Radiation Res.*
Recueil de Médecine Vétérinaire. France.	*Rec. Méd. vét.*
Refuah Veterinarith. Israel.	*Refuah vet.*
Rendiconti Instituto Superiore di Sanità. Italy.	*R. C. Ist. sup. Sanit.*

Title	*Abbreviation*
Reporter. Ceylon. *See* Ceylon Veterinary Services Reporter.	
Repositório de Trabalhos do Laboratório Central de Patologia Veterinária. Portugal.	*Repos. Lab. Pat. vet., Lisboa.*
Research. Great Britain.	*Research. Lond.*
Resenha Veterinaria. Brazil.	*Resen. vet. Rio de J.*
Review of Applied Entomology. Series B. Great Britain.	*Rev. appl. Ent. Ser. B.*
Review of Applied Mycology. Great Britain.	*Rev. appl. Mycol.*
Review of Medical and Veterinary Mycology. Great Britain.	*Rev. med. vet. Mycol.*
Revista de Agricultura. Costa Rica.	*Rev. Agric., S. José.*
Revista Ceres. Brazil.	*Ceres, Minas Gerais.*
Revista de Ciências Veterinárias. (*Formerly* Revista de Medicina Veterinaria.) Portugal.	*Rev. Cienc. vet., Lisboa.*
Revista de la Facultad de Agronomía y Veterinaria. Argentina.	*Rev. Fac. Agron, B. Aires.*
Revista de Faculdad de Medicina Veterinaria. Brazil.	*Rev. Fac. Med. vet., S. Paulo.*
Revista de la Facultad de Medicina Veterinaria. Peru.	*Rev. Fac. Med. vet., Lima.*
Revista de la Facultad de Medicina Veterinaria y de Zootecnia. Colombia.	*Rev. Fac. Med. vet., Bogota.*
Revista Grancolombiana de Zootecnia, Higiene y Medicina Veterinaria. Venezuela.	*Rev. grancolomb. Zootec.*
Revista del Instituto Bacteriologico Malbrán. Argentina.	*Rev. Inst. bact., B. Aires.*
Revista del Instituto Nacional de Biologia Animal. Peru.	*Rev. Inst. nac. Biol. anim., Lima.*
Revista Kuba de Medicina Tropical y Parastologia. Cuba.	*Rev. Kuba Med. trop.*
Revista de Medicina Veterinaria. Argentina.	*Rev. Med. vet., B. Aires.*
Revista de Medicina Veterinaria. Uruguay.	*Rev. Med. vet., Montevideo.*
Revista de Medicina Veterinaria y Parasitologia. Venezuela.	*Rev. Med. vet., Caracas.*
Revista Militar de Remonta e Veterinaria. Brazil.	*Rev. Milit. Rem. Vet., Rio de J.*
Revista de la Sociedad de Medicina Veterinaria de Chile. Chile.	*Rev. Soc. Med. vet., Santiago.*
Revista de Veterinaria Militar. Argentina.	*Rev. Vet. Milit., B. Aires.*
Revue Canadienne de Biologie. Canada.	*Rev. canad. Biol.*
Revue du Corps Vétérinaire de l'Armée. (*Formerly* Revue Vétérinaire Militaire.) France.	*Rev. Cps vét. Armée.*
Revue d'Elévage et de Médecine Vétérinaire des Pays Tropicaux. France.	*Rev. Élev.*
Revue d'Immunologie et de Thérapie Antimicrobienne. France.	*Rev. Immunol.*
Revue de Médecine Vétérinaire. France.	*Rev. Méd. vét.*
Revue d'Oka. Canada.	*Rev. Oka.*
Revue de Pathologie Générale et Comparée. France.	*Rev. Path. comp.*
Rhodesia Agricultural Journal. Southern Rhodesia.	*Rhod. agric. J.*
Rindertuberkulose. (Supplement to Monatshefte für Tierheilkunde.) Germany.	*Rindertuberkulose.*
Rivista di Medicina Veterinaria e Zootecnia. Italy.	*Riv. Med. vet., Parma.*
Rivista di Parassitologia. Italy.	*Riv. Parassit.*
Roczniki Nauk Rolniczych. Series B & E. Poland.	*Roczn. Nauk. rol.*
Royal Sanitary Institute Journal. (*Formerly* Journal of the Royal Sanitary Institute.) Great Britain.	*R. sanit. Inst. J.*
Rundschau für Fleischbeschauer und Trichinenschauer. Germany.	*Rdsch. Fleischbesch. Trichinensch.*
Sborník Československé Akademie Zemědělské. Czechoslovakia.	*Ann. Acad. techécosl. Agric.*
Scandinavian Journal of Clinical and Laboratory Investigation. Norway.	*Scand. J. clin. Lab. Invest.*
Schweizer Archiv für Tierheilkunde. Switzerland.	*Schweiz. Arch. Tierheilk.*
Schweizerische Zeitschrift für Allgemeine Pathologie und Bakteriologie. Switzerland.	*Schweiz. Z. allg. Path.*
Science. U.S.A.	*Science.*
Scientific Proceedings. Royal Dublin Society. Republic of Ireland.	*Sci. Proc. R. Dublin Soc.*
Scottish Agriculture. Great Britain.	*Scot. Agric.*
Sitzungsberichte. Österreichische Akademie der Wissenschaften. Abteilung 1. Austria.	*S.B. öst Akad. Wiss.*
Soap and Chemical Specialities. U.S.A.	*Soap, N.Y.*
South African Journal of Medical Sciences. Union of South Africa.	*S. Afr. J. med. Sci.*
South African Journal of Science. Union of South Africa.	*S. Afr. J. Sci.*
South African Medical Journal.	*S. Afr. med. J.*
Stain Technology. U.S.A.	*Stain Tech.*
Studies from the Rockefeller Institute for Medical Research. U.S.A.	*Stud. Rockefeller Inst. med. Res.*
Suomen Eläinlääkärilehti (Finsk Veterinärtidskrift). Finland.	*Finsk VetTidskr.*
Tabulae Biologicae. Netherlands.	*Tabul. biol., Hague.*
Tasmanian Journal of Agriculture. Australia.	*Tasm. J. Agric.*
Texas Veterinary Bulletin. U.S.A.	*Tex. vet. Bull.*
Tierärztliche Umschau. Germany.	*Tierärztl. Umsch.*
Tijdschrift voor Diergeneeskunde. Netherlands.	*Tijdschr. Diergeneesk.*
Trabajos del Instituto de Biologia Animal. Spain.	*Trab. Inst. Biol. anim. Madr.*

Title	*Abbreviation*
Transactions of the Highland and Agricultural Society of Scotland. Great Britain.	*Trans. Highl. agric. Soc. Scot.*
Transactions of the New York Academy of Sciences. U.S.A.	*Trans. N.Y. Acad. Sci.*
Transactions of the Royal Society of Canada. Section V. Biological Sciences. Canada.	*Trans. roy. Soc. Can.*
Transactions of the Royal Society of South Australia. Australia.	*Trans. roy. Soc. S. Aust.*
Transactions of the Royal Society of Tropical Medicine and Hygiene. Great Britain.	*Trans. R. Soc. trop. Med. Hyg.*
Translated Contents Lists of Russian Periodicals. Great Britain.	*Transl. Cont. Lists Russ. Period.*
Tropical Agriculture. Trinidad. British West Indies.	*Trop. Agriculture, Trin.*
Tropical Agriculturist. Ceylon.	*Trop. Agriculturist.*
Tropical Diseases Bulletin. Great Britain.	*Trop. Dis. Bull.*
Trudy Gelmintologicheskoĭ Laboratorii. U.S.S.R.	*Trud. gel'mint. Lab.*
Tubercle. Great Britain.	*Tubercle, Lond.*
Tuberculosis Index. Great Britain.	*Tuberc. Index.*
Türk Veteriner Hekimleri Dernigi Dergisi. Turkey.	*Türk vet. Hekim. dern. Derg.*
U.N.E.S.C.O. Bulletin for Libraries. France.	*U.N.E.S.C.O. Bull. Libr.*
United Provinces Veterinary Magazine. India.	*Unit. Prov. vet. Mag.*
Vacuum. Great Britain.	*Vacuum.*
Veteran. Great Britain.	*Veteran, Glasgow.*
Veterinaires. France	*Veterinaires.*
Veterin-Extracta. Spain.	*Veterin-Ext.*
Veterinär-Medizinische Nachrichten. Germany.	*Vet.-med. Nachr.*
Veterinária. Revista dos Alunos da Escola Nacional de Veterinária. Brazil.	*Veterinária, Rio de J.*
Veterinaria. Italy.	*Veterinaria, Milano.*
Veterinaria. Spain.	*Veterinaria, Madrid.*
Veterinaria. Yugoslavia.	*Veterinaria, Sarajevo.*
Veterinaria. Organo Oficial de la Association de Estudiantes de Veterinaria. Uruguay.	*Veterinaria, Montevideo.*
Veterinaria Italiana. (*Formerly* Croce Azzurra.) Italy.	*Vet. ital.*
Veterinariya. U.S.S.R.	*Veterinariya, Moscow.*
Veterinarski Archiv. Yugoslavia.	*Vet. Arhiv.*
Veterinarski Glasnik. Yugoslavia.	*Vet. Glasn.*
Veterinársky Časopis. Czechoslovakia.	*Vet. Čas.*
Veterinářství. Czechoslovakia.	*Veterinářství, Brno.*
Veterinarstvo. Yugoslavia.	*Veterinarstvo, Zagreb.*
Veterinary Extension Quarterly. University of Pennsylvania. U.S.A.	*Vet. Ext. Quart. Univ. Pa.*
Veterinary Medicine. U.S.A.	*Vet. Med.*
Veterinary Record. Great Britain.	*Vet. Rec.*
Veterinary Research. Japan.	*Vet. Res., Japan.*
Veterinary Review. India.	*Vet. Rev., Calcutta.*
Veterinary Science News. U.S.A.	*Vet. Sci. News.*
Veteriner Fakültesi Dergisi. Turkey.	*Vet. Fak. Derg.*
Virchow's Archiv für Pathologische Anatomie und Physiologie und für Klinische Medizin. Germany.	*Virchows Arch.*
Vlaams Diergeneeskundig Tijdschrift. Belgium.	*Vlaam. diergeneesk. Tijdschr.*
West Indian Medical Journal. Jamaica.	*W. Ind. med. J.*
Wiener Tierärztliche Monatsschrift. Austria	*Wien. tierärztl. Mschr.*
Wissenschaftliche Zeitschrift der Humboldt-Universität zu Berlin. Germany.	*Wiss. Z. Humboldt-Univ.*
Wissenschaftliche Zeitschrift der Karl-Marx-Universität, Leipzig. Germany.	*Wiss. Z. Karl-Marx-Univ.*
World's Poultry Science Journal. U.S.A.	*World's Poult. Sci. J.*
Yale Journal of Biology and Medicine. U.S.A.	*Yale J. Biol. Med.*
Zeitschrift für Hygiene und Infektionskrankheiten. Germany.	*Z. Hyg. InfektKr.*
Zeitschrift für Krebsforschung. Germany.	*Z. Krebsforsch.*
Zeitschrift für Parasitenkunde. Germany.	*Z. Parasitenk.*
Zeitschrift für Tropenmedizin und Parasitologie. Germany.	*Z. Tropenmed. u. Parasit.*
Zentralblatt für Allgemeine Pathologie und Pathologische Anatomie. Germany.	*Zbl. allg. Path. path. Anat.*
Zentralblatt für Bakteriologie, Parasitenkunde, Infektionskrankheiten und Hygiene. Erste Abteilung. Originale: Referate. Germany.	*Zbl. Bakt. I.*
Zentralblatt für Veterinärmedizin. Germany.	*Zbl. VetMed.*
Zhurnal Mikrobiologii Epidemiologii i Immunobiologii. U.S.S.R.	*J. Microbiol., Moscow.*
Zooiatria. Revista da Medicina Veterinaria y Produccion Pecuaria. Chile.	*Zooiatria, Chile.*
Zooprofilassi. Italy.	*Zooprofilassi.*
Zootechnia. Acta Societatis Internationalis Veterinariorum Zootechnicorum. Spain.	*Zootechnia, Madrid.*
Zootechnia e Veterinaria—La Fecondazione Artificiale. Italy.	*Zootec. e Vet.*

(b) ANNUAL REPORTS OF GOVERNMENT DEPARTMENTS AND RESEARCH INSTITUTES ETC.

Note: As these are all reports the word "Report" is omitted in this list.

INTERNATIONAL

Work of the F.A.O. Director General to F.A.O.
Bureau Permanent Interafricain de la Tsé-Tsé et de la Trypanosomiase.

EUROPE

British Commonwealth and Empire

Great Britain.
Animal Health Services. Proceedings under the Diseases of Animals Act.
Agricultural Research. Council.
Colonial Research.
Colonial Research Committee Progress Report.
Colonial Development Corporation Reports and Accounts.
Ministry of Health.
Medical Research Council.
Agricultural Improvement Council for England and Wales.
The Animal Health Trust.
National Farmers' Union.
Royal Veterinary College and Hospital.
London School of Hygiene and Tropical Medicine.
Lister Institute of Preventive Medicine.
Imperial Institute.
Royal College of Surgeons of England Scientific Report.
University of London. The College of the Pharmaceutical Society of Great Britain.
British Empire Cancer Campaign.
Universities Federation for Animal Welfare.
National Institute for Research in Dairying, University of Reading.
The Incorporated Liverpool School of Tropical Medicine.
The Ciba Foundation.
Council of the Royal College of Veterinary Surgeons.
Imperial Cancer Research Fund.
Northern Counties Animal Diseases Research Fund. Memorial to Alan. 8th Duke of Northumberland ("The Duke's Fund") Sheep and Lamb Diseases.
City of Leeds. Annual Report of the Medical Officer of Health.
City of Manchester Markets Committee.
City and County of Newcastle-upon-Tyne, Veterinary Department.
Animal Diseases Research Association. Moredun Institute, Edinburgh.
Department of Health for Scotland (contains Report of the Veterinary Department).
Royal College of Physicians of Edinburgh. Curator of Laboratory.
Edinburgh and East of Scotland College of Agriculture.
The West of Scotland Agricultural College, Glasgow.
The Hannah Dairy Research Institute.

Northern Ireland.
Ministry of Agriculture.
Belfast, City Veterinarian.
Agricultural Research Institute, Hillsborough.
Isle of Man.
Board of Agriculture and Fisheries.
Malta.
Department of Agriculture.

Republic of Ireland

Minister of Agriculture and Veterinary College of Ireland.
Diseases of Animals Acts, Quarterly Statistics.
Medical Research Council.
Dublin County Council. County Medical Officer of Health.

European Continental Countries

Belgium.
Institut pour la Recherche Scientifique en Afrique Centrale.
Denmark.
Aarsberetning fra Veterinaer Direktoratet.
Meddelelse fra Kanin Kontrol Stationen.
Beretning om Sammenlignende Forsøg med Svin fra Statsanerkendte Avlscentre.
Kongelige Veterinaer og Landbohøjskole Aarskrift.
Københavns Bundhedskommissions Dyrlaeger.
Finland.
Eläinlääkintölaitos Maatalousministeriön Eläinlääkintoosaston kertomus Vuosilta.
Italy.
Istituto Zooprofilattico Sperimentale delle Venezie, Università degli Studi Padova.
Netherlands.
Verslag van den Directeur van den Veeartsenijkundigen Dienst omtrent de Werkzaamheden van den Veeartsenijkundigen Dienst en den Gezondheidstoestand van den Veestapel.
Verslag van den Veterinair Hoofdinspector van de Volksgezondheid belast met het toezicht op Naleving van de Vleeschkeuringswet.
Verslag van de Werkzaamheden der Rijksseruminrichting.
Verslagen en Mededeelingen van de Directie van den Landbouw in Nederland. (Verslag over den Landbouw in Nederland.)
Jaarverslag van de Provinciale Gezondheidsdienst voor Dieren in Zuid Holland.
Mededeelingen betreffende den Gezondheidsdienst voor Vee in Friesland.
Jaarverslag van de Centrale Commissie van Toezicht op de Uitvoering van de Kunstmatige Inseminatie.
Norway.
Veterinaervesenet. Norges Offisielle Statistikk.

Sweden.
Veterinärvård vid Armén. Sveriges Officiella Statistik. Hälso- och Sjukvård.
Hälso- och Sjukvård vid Försvaret av Försvarets Sjukvårds-förvaltning.

ASIA

British Commonwealth and Empire

Ceylon.
Director of Agriculture.

Cyprus.
Chief Veterinary Officer.
Livestock Officer.

Hong Kong.
Urban Council & Sanitary Department (contains Government Veterinary Officer's Report).

India.
Indian Council of Agricultural Research.
Indian Institute of Veterinary Research, Muktesar and Izatnagar.
Indian Dairy Department.
Department of Animal Husbandry and Veterinary Science, Bombay.
Civil Veterinary Department, Assam.
Civil Veterinary Department, Orissa.
Civil Veterinary Department, East Punjab.
Civil Veterinary Department, Bihar.
Animal Husbandry Department, Himachal Pradesh.
Administration of Coorg.
Civil Veterinary Department, Manipur.
Veterinary and Animal Husbandry Services, Madhya Bharat.
Veterinary and Animal Husbandry Services, Gwalior.
Civil Veterinary Department, Central Provinces and Berar.
Animal Husbandry Department, Madras.
Madras Veterinary College.
Animal Husbandry Department. United Provinces.
Animal Husbandry Department, Uttar Pradesh.

Indonesia.
Mendjadi Dokter Hewan Fakultet Kedokteran Hewan.

Malaya.
Veterinary Department.
Institute for Medical Research, Kuala Lumpur.

North Borneo.
Department of Agriculture.

Pakistan.
Assistant Veterinary Investigation Officer (Poultry) Province of Sind.
Civil Veterinary Department, Sind.
Baluchistan Agency.

Sarawak.
Department of Agriculture.

Other Countries

Japan.
Government Experimental Station for Animal Hygiene.
Statistics of Animal Hygiene, Tokyo.

AFRICA

British Commonwealth and Empire

Union of South Africa.
Director of Abattoir, Livestock Markets, Veterinary Services, Ice and Cold Storage Department, Johannesburg.
South African Institute for Medical Research.
South African Council for Scientific and Industrial Research.

Southern Rhodesia.
Director of Veterinary Services.
Director of Veterinary Research.
Director of Tsetse Fly Operations.
Division of Entomology.

Anglo-Egyptian Sudan.
Sudan Veterinary Service.

Basutoland.
Department of Agriculture.

Bechuanaland Protectorate.
Veterinary Department.

Gambia.
Veterinary Department.
Department of Development and Agriculture.

Gold Coast.
Department of Animal Health.

Kenya.
East African Agricultural and Forestry Research Organization.
East African Tsetse and Trypanosomiasis Research and Reclamation Organization.
East African Veterinary Research Organisation.
Department of Veterinary Services.
Interafrican Bureau of Epizootic Diseases.

Mauritius.
Department of Agriculture.

Nigeria.
Veterinary Department, Northern Provinces.
Sleeping Sickness Service.
West African Institute for Trypanosomiasis Research.

Northern Rhodesia.
Veterinary Department.
Game and Tsetse-Control Department.
Department of Agriculture.

Nyasaland Protectorate.
Department of Veterinary Services & Animal Industry.

Seychelles.
Department of Agriculture.

Sierra Leone.
Veterinary Department.

Somaliland Protectorate.
Department of Agricultural and Veterinary Services.

Swaziland.
Veterinary Department.
Livestock and Agricultural Department.
Department of Native Land Settlement.

Tanganyika Territory.
Department of Veterinary Services.
Tsetse Research Department.

Uganda Protectorate.
Department of Veterinary Services & Animal Industry.
Virus Research Institute.

Zanzibar.
Department of Agriculture.

BELGIAN TERRITORIES

Institut pour la Recherche Scientifique en Afrique Centrale.

FRENCH UNION

Rapport du Conseil de l'Experimentation et des Recherches Agronomiques, Algérie.
L'Institut Pasteur du Maroc.
L'Institut Pasteur de Brazzaville, Congo.
Archive de l'Institut Pasteur Tananarive. (Extrait du Rapport Annuel.)

AMERICA

BRITISH COMMONWEALTH AND EMPIRE

Canada.
Veterinary Director General, Production Service of Agriculture.
Science Service, Dominion Department of Agriculture.
National Research Council.
Minister of Agriculture.
Dominion Bureau of Statistics.
Fur Farms of Canada.
Alberta. Department of Agriculture.
British Columbia. Department of Agriculture. Agricultural Statistics. Provincial Game Commission Report.
Crops, Livestock etc., Manitoba.
Department of Agriculture, New Brunswick.
Department of Agriculture, Province of Nova Scotia.
Ontario Research Foundation.
Ontario Veterinary College.
Department of Agriculture of the Province of Prince Edward Island.
École de Médecine Vétérinaire, Montréal, Quebec.
Minister of Agriculture of the Province of Quebec.
Department of Agriculture for Saskatchewan.
Bermuda.
Department of Agriculture.
British Guiana.
Livestock and Veterinary Division.
Director of Agriculture.
Crop and Livestock Census.
British Honduras.
Department of Agriculture. Survey of the Livestock Industry by the Veterinary Officer.
Falkland Islands.
Department of Agriculture.
Stock Returns.
Bahamas.
Agricultural and Marine Products Board.
Barbados.
Department of Science and Agriculture.
Jamaica.
Department of Agriculture.
Leeward Islands.
Departments of Agriculture and Veterinary Service.
Trinidad.
Director of Agriculture.
Director of Medical Services.
Windward Islands.
Agricultural Department, Dominica.
Agricultural Department, Grenada.
Department of Agriculture, St. Lucia.
Agricultural Department, St. Vincent.

FRENCH UNION

L'Institut Pasteur de Guyane Française et du Territoire de l'Inini.

UNITED STATES OF AMERICA

Secretary of Agriculture. U.S. Department of Agriculture, Washington, D.C.
Bureau of Animal Industry, Department of Agriculture.
Livestock Conservation, Inc. [formerly National Livestock Loss Prevention Board].
Administrator of Agricultural Research.
Agricultural Experiment Stations.
Participation in the National Poultry Improvement Plan. Bureau of Animal Industry.
Surgeon General of the Public Health Service of the U.S.A.
Surgeon General, U.S. Army. (War Department.)
Gorgas Memorial Laboratory, Washington, D.C.
Bureau of Dairy Industry. Agricultural Research Administration.
Bureau of Entomology and Plant Quarantine.
Rockefeller Foundation. International Health Division.
Commonwealth Fund.
Division of Laboratories and Research
National Vitamin Foundation.
Agricultural Experiment Station of Alabama.
University of Arizona, College of Agriculture, Agricultural Experiment Station, Tucson, Arizona.
University of Arkansas College of Agriculture, Agricultural Experiment Station [contained in *Arkansas Farm Research*
Livestock Department, Los Angeles County, California.
State of California, Department of Agriculture.
Agricultural Experiment Station, College of Agriculture, University of California.
Colorado Agricultural Experiment Station.
Storrs Agricultural Experiment Station, Connecticut.
Connecticut Agricultural Experiment Station, New Haven.
University of Delaware, Agricultural Experiment Station.
University of Florida, Agricultural Experiment Station.
Georgia Experimental Station of the University System of Georgia.
Georgia Coastal Plain Experiment Station.
Agricultural Experiment Station. University of Idaho.
University of Illinois. Agricultural Experiment Station.
Purdue University, Indiana. Agricultural Experiment Station, Lafayette.
Agricultural Research. Iowa State College of Agriculture.
Manhattan, Kansas. Agricultural Experiment Station.

Agricultural Experiment Station of the University of Kentucky.
Agricultural Experiment Station, Louisiana State University and Agricultural and Mechanical College.
North-East Louisiana Experiment Station. (Biennial.)
North Louisiana Experiment Station. (Biennial.)
Maine Agricultural Experiment Station.
Agricultural Experiment Station, University of Maryland.
Massachusetts Agricultural Experiment Station.
School of Veterinary Medicine, Michigan State College, East Lansing.
State Board of Agriculture of the State of Michigan.
Agricultural Experiment Station Michigan State College of Agriculture.
Regional Poultry Research Laboratory, Michigan.
Agricultural Experiment Station, University of Minnesota.
Mississippi Experiment Station.
Missouri Agricultural Experiment Station.
Livestock Sanitary Board, Montana.
Montana Agricultural Experiment Station.
State Entomologist of Montana.
Agricultural Experiment Station, Nebraska.
Agricultural Experiment Station, Nevada.
State of Nevada. State Department of Agriculture. (Biennial.)
New Hampshire Agricultural Experiment Station.
New Jersey Livestock Sanitary Association.
New Jersey State Agricultural Experiment Station.
Agricultural Experiment Station of the New Mexico College of Agriculture and Mechanic Arts.
New York State Agricultural College at Cornell University.
New York State Veterinary College at Cornell University.
New York Agricultural Experiment Station.
New York State Association of Milk Sanitarians.
North Carolina Agricultural Experiment Station.
Experiment Station Progress, North Dakota, Agricultural College.
Livestock Sanitary Board. North Dakota.
Ohio Agricultural Experiment Station, Wooster.
Ohio Agricultural Statistics.
Oklahoma Agriculture and Mechanic Arts College, Agricultural Experiment Station.
Oregon State College, Agricultural Experiment Station. (Biennial.)
Pennsylvanian Agricultural Experiment Station.
Rhode Island State College, Agricultural Experiment Station.
South Carolina Experiment Station. Clemson Agricultural College.
South Dakota Agricultural Experiment Station.
University of Tennessee Agricultural Experiment Station.
Texas Agricultural Experiment Station.
Utah Agricultural Station (Biennial).
Vermont Agricultural Experiment Station, University of Burlington, Vermont.
Virginia Agricultural Experiment Station.
State College of Washington, Agricultural Experiment Station.
Western Washington Experiment Station.
West Virginia Agricultural Experiment Station.
University of Wisconsin, Madison, Agricultural Experiment Station.
Wyoming Agricultural Experiment Station.
Puerto Rico Experiment Station.
Hawaii Agricultural Experiment Station.

AUSTRALASIA AND OCEANIA

British Commonwealth and Empire

Australia.
Commonwealth Scientific and Industrial Research Organization.
Australian Wool Board.
Live Stock Health Report. New South Wales.
Northern Territory Administration. Animal Industry Division.
Queensland. Division of Animal Industry.
"Stock and Brands" Department, South Australia.
The Institute of Medical and Veterinary Science, South Australia.
Department of Agriculture, Western Australia.
Animal Health Service, Department of Agriculture, Tasmania.

New Zealand.
Director General of Agriculture.
Department of Scientific and Industrial Research.
Animal Research Division of the Department of Agriculture.
Livestock Division, Department of Agriture.
New Zealand Society of Animal Production.
Dairy Board.
Canterbury Agricultural College, University of New Zealand.
Cawthron Institute.

Fiji.
Veterinary Division, Department of Agriculture.
Legislative Council, Department of Agriculture.

PLAN OF ARRANGEMENT OF ABSTRACTS IN THE VETERINARY BULLETIN

The following is a guide to the order of abstracts in the *Veterinary Bulletin*. For diagnosis and diagnostic agents (tuberculin etc.) see under appropriate disease. The guide is necessarily limited to key words and frequently occurring items.

Abstracts are serially numbered and cross-referenced by number among the twenty-one different sections.

I. Diseases Caused by Bacteria and Fungi

AEROBES
- Cocci
  - Staphylococci
  - Streptococci
  - Mastitis (under appropriate causal agent)
  - Strangles
  - Micrococci (including Botryomycosis)
  - Vibrios
  - Spirilla
- Bacilli
  - Anthrax
- Mycobacteria
  - Tuberculosis
  - Johne's disease
- Corynebacteria
  - Caseous lymphadenitis
  - Ulcerative lymphangitis
- *Pfeifferella mallei* (Glanders)
- *Erysipelothrix rhusiopathiae* (Swine Erysipelas)
- *Erysipelothrix (Listeria) monocytogenes*
- *Pasteurella*
  - Haemorrhagic septicaemia
- *Pseudomonas*
- *Haemophilus*
- *Proteus*
- Colon-Typhoid Group
- Salmonella Group
  - Infection in mammals
    - Abortion in mares
    - Abortion in ewes
    - Porcine enteritis
  - Infection in birds
    - Pullorum disease (B.W.D.)
    - Fowl typhoid
  - Meat poisoning infections
- Brucella Group
  - *Br. abortus*
  - *Br. suis*
  - *Br. melitensis*
  - *Br. tularensis*

Spirochaetes
- *Leptospira*

ANAEROBES
- Clostridia
  - Blackleg
  - Malignant oedema
  - Clostridial infections of sheep
  - Tetanus
  - Botulism
- Vibrios
- *Fusiformis*

FUNGI
- *Mucor*
- *Coccidioides*
- *Candida*
- *Histoplasma*
  - *Histoplasma capsulatum*
  - *Histoplasma farciminosum* (Epizootic Lymphangitis)
- Ringworm
- *Aspergillus*
- *Actinomyces*
- *Actinobacillus*

PLEURO-PNEUMONIA GROUP
- Bovine Contagious Pleuro-Pneumonia
- Pleuro-Pneumonia-Like Organisms including Contagious Agalactia of Goats and Sheep

BACTERIAL FLORA OF ANIMAL TISSUES

METABOLISM AND NUTRITION OF MICRO-ORGANISMS

VARIOUS OTHER UNCLASSIFIED MICRO-ORGANISMS
- *Bartonella*
- *Eperythrozoon*
- *Grahamella*

II. Diseases Caused by Protozoan Parasites

- Amoebiasis
- Trypanosomiasis
- Leishmaniasis
- Trichomoniasis
- Blackhead of Turkeys (*Histomonas meleagridis*)
- Infectious Enteritis of Turkeys (*Hexamita*)
- Coccidiosis
- Malaria
- Piroplasmosis
- Theileriasis
- Anaplasmosis
- Toxoplasmosis
- Sarcosporidiosis

III. Diseases Caused by Viruses and Rickettsia.

- Virus Infections not Limited to Single Species
  - Foot and mouth disease
  - Aujeszky's disease
  - Rabies
  - Pox diseases
  - Influenza group
  - Encephalitis group
    - Equine encephalomyelitis
- Virus Diseases of Equines
  - Respiratory infections
  - Equine infectious anaemia
  - African horse sickness
  - Virus abortion
- Virus Diseases of Cattle
  - Rinderpest
  - Bovine malignant catarrh
  - Three-day fever
  - Respiratory infections
  - Lumpy skin disease
- Virus Diseases of Sheep and Goats
  - Bluetongue
  - Contagious ecthyma
  - Louping-Ill
  - Virus abortion
- Virus Diseases of Swine
  - Swine fever
  - Porcine encephalomyelitis (Teschen disease)
  - Vesicular exanthema
- Virus Diseases of Carnivora
  - Of dogs
  - Of cats
  - Of foxes
  - Of other Carnivora
- Virus Diseases of Rodents
- Virus Diseases of Birds
  - Fowl plague
  - Newcastle disease
  - Respiratory infections
  - Psittacosis
- Virus Diseases of Man
- Bacteriophage
- Rickettsial Infections
  - Heartwater
  - Rickettsial conjunctivitis

IV. Immunity

- General Immunology
- Immunization and Immunizing Agents

Serology
Allergy and Anaphylaxis
Tissue Invasiveness (Permeability)
Various

V. **Parasites in Relation to Disease [General]**

VI. **Parasites in Relation to Disease [Arthropods]**
Lice
Bugs
Fleas
Dipterous Flies
Blowflies and fleshflies
Oestrids (warbleflies and botflies)
Biting muscids *(Stomoxys, Siphona, Glossina)*
Tabanids
Midges
Mosquitoes
Sheep ked
Pentastomes
Linguatula
Ticks
Mites

VII. **Parasites in Relation to Disease [Helminths]**
TREMATODES
CESTODES
Taenia
Cysticercosis
Echinococcosis
NEMATODES
Strongyloides
Trichurids
Trichinosis
Strongyles
Sclerostomes
Hookworms
Parasitic gastro-enteritis
Lungworms
Poultry gapeworm
Oxyurids
Ascarids
Spirurids
Filariae
Acanthocephala

VIII. **Spontaneous and Transmissible Neoplasms and Leucaemias [Including Fowl Paralysis]**
Spontaneous Tumours
Cancer Research
Virus Tumours of Rodents
Fowl Sarcoma
Fowl Paralysis

IX. **Nutritional and Metabolic Disorders**
General Nutrition
Carbohydrates, Fats, Proteins, Amino Acids, etc.
Minerals
Osteodystrophia and Rickets
Vitamins
Metabolic Disorders

X. **Diseases, General**
General and Collective
Special Animal Pathology—Unclassified Diseases of Particular Animals
Haematology
Radiation Injuries
Special Regional Pathology—Unclassified Diseases of Particular Body Systems
Histopathology

XI. **Poisons and Poisoning**
Inorganic
Organic and Alkaloid
Plant Poisons
Photosensitization
Poisoning by Ingestion of Arthropods
Venoms
Poisoning by Therapeutic Agents
Miscellaneous including War Gases

XII. **Pharmacology and General Therapeutics**
(For treatment of specific infections see under the appropriate disease.)
General Chemotherapy and Pharmacology
Antibiotics
Treatment of Unclassified Diseases
Vitamin Therapy
Hormone Therapy
Antidotes
Anaesthesia
Wound Treatment
Antiseptics and Disinfectants

XIII. **Physiology, Anatomy and Biochemistry**
General
Enzymes
Metabolism
Lactation
Normal Haematology and Blood Groups
Regional Physiology (Circulatory, Digestive, Respiratory, Nervous, Skeletal, Urino-Genital and Endocrine Systems)
Wound Healing
Anatomy
Biochemistry

XIV. **Public Health, Veterinary Services and Veterinary Education**
Milk Hygiene
Meat Hygiene
Food Poisoning
Rodent Control
Legislation and Veterinary Police Measures
Education

XV. **Livestock Hygiene**
Farm Buildings
Ventilation
Drainage
Disinfection
Water Supply
Pastures and Grazing
Conservation of Foodstuffs and Fodder

XVI. **Reproduction and Reproductive Disorders**
Artificial Insemination
Pregnancy Diagnosis
Sex Hormones
Sterility and Infertility
Hereditary Diseases
Lethal Factors and Teratology
Management of Breeding Stock

XVII. **Zootechny**
Acclimatization
Marking and Identification of Livestock
Dips and Dipping Tanks
Dehorning
Shearing
Castration
Hides and Skins
Humane Slaughter
Various

XVIII. **Technique and Apparatus**
Bacteriological
Parasitological
Microscopy and Optics
Histological
Laboratory, Various

XIX. **Miscellaneous**

XX. **Reports** (of State and Local Government Departments and of Institutes, Schools, and Other Corporate Bodies)

XXI. **Book Reviews**

COMMONWEALTH BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

Vol. 25] January, 1955 [No. 1

DISEASES CAUSED BY BACTERIA AND FUNGI

PRICE, P., NEAVE, F. K., RIPPON, J. E. & WILLIAMS, R. E. O. (1954). **The use of phage typing and penicillin sensitivity tests in studies of staphylococci from bovine mastitis.** —*J. Dairy Res.* **21,** 342-353. [Authors' summary copied *verbatim.*] **1**

In three heavily infected herds there were sufficient types of staphylococci to enable phage typing to be of use in distinguishing between strains present before and after intramammary infusions with antibiotics. Two phage types were rarely found in established infections in one quarter even when three or four distinguishable types were present in a herd. But two types were sometimes found in milk samples when the teat apex was unhealthy and truly aseptic sampling by the usual procedure was impractical. In quarters infected for many months phage type and penicillin sensitivity (and resistance) were found to be very stable. There were only two spontaneous replacements of one phage type by another.

EDWARDS, S. J. (1954). **Antibiotic therapy in staphylococcal infection of the bovine udder.** —*J. comp. Path.* **64,** 275-281. [Abst. from author's summary.] **2**

In comparative tests of certain antibiotics injected *via* the teat canal in the treatment of staphylococcal infection of the udder of 37 lactating cows, aureomycin, penicillin, streptomycin, and a combination of the last two, were approx. equally effective and about 80% of infected quarters responded to one or two courses of treatment. Six of the cows which were refractory to intramammary injection failed to respond to further treatment including the intramuscular inj. of antibiotics in three cases. Failure to eliminate infection from the udder was related to the duration of infection and not to the development of increased resistance of the staphylococcal strain to the antibiotic employed.

SELBIE, F. R. (1954). **Comparison of sodium and procaine penicillin in treatment of experimental staphylococcal infection in mice.**—*Brit. med. J.* June 12th, 1350-1353. [Author's summary modified.] **3**

Sodium penicillin is as effective as either oily or aqueous procaine penicillin in the treatment of an experimental staphylococcal infection in mice. The curative effects of penicillin depend not so much on the aggregate time that an effective level of penicillin is present in the blood as on other factors, of which the most important is the co-operation of the defence mechanisms of the host.

DUTHIE, E. S. (1954). **Evidence of two forms of staphylococcal coagulase.**—*J. gen. Microbiol.* **10,** 427-436. [Author's summary modified.] **4**

Staphylococci produce coagulase in two forms. One is bound to the cell wall and reacts to the slide test described by Much. The other is liberated as free coagulase in the medium and reacts to the tube test described by Loeb. Bound coagulase acts directly on the fibrinogen of certain animals which then causes clumping of the staphylococcal cells, while free coagulase acts on the 'prothrombin' of certain animals to give a thrombin-like product. Bound coagulase is antigenically distinct from free coagulase. Free coagulase is concerned in the autolysis and it can be used to produce specific antibodies in rabbits.

TASMAN, A. & VAN DER SLOT, J. (1953). **On a new method of preparing staphylococcus toxin and toxoid.** — *Leeuwenhoek ned. Tijdschr.* **19,** 256-266. [In English.] **5**

The authors described a method for the preparation of staphylococcus toxin, which differed from the method described by Parish and Clark (1931-32) in that the toxin was extracted from agar cultures with physiological saline.—R.M.

EDWARDS, S. J. (1954). **The control and treatment of certain forms of mastitis.**—*Vet. Rec.* **66,** 37-41. **6**

E. discussed mastitis due to *Streptococcus agalactiae* under the headings: Incidence, Treatment (individual and herd, with special reference to antibiotics, particularly penicillin) and Control, including the effects of management and milking practices. He also discussed staphylococcal mastitis, treatment in this case being as yet limited to individuals.

—C. A. E. BRIGGS.

MCKAY, W. M. & MACPHERSON, D. A. (1954). **The value of iodised mineral oil in the treatment of bovine mastitis.**—*Brit. vet. J.* **110,** 167-182. **7**

The authors treated mastitis in 55 cows from several herds by the intramammary injection of up to 500 ml. of a 1:1250 solution of iodine in liquid paraffin. *Staph. pyogenes* was isolated before treatment from the mammary secretion of 18 of the cows, *Str. agalactiae* from 13 cows, *Str. dysagalactiae* from 10 cows and *Str. uberis* from 8 cows. Twenty-five of the cases had been previously treated with sulphanilamide or penicillin. [See also *V.B.* **12,** p. 355.]—R.M.

MURPHY, J. M. & STUART, O. M. (1952). **Studies on the growth *in vitro* of a strain of *Streptococcus agalactiae* in milk from infected and uninfected cows.**—*Cornell Vet.* **42,** 537-558. **8**

In vitro studies indicated that the power of normal milk to inhibit the growth of *Str. agalactiae* is not great enough to provide a significant barrier to natural infection. Growth to a visible level in milk, after a light inoculation, took an average of 3 hours longer than in broth controls.—C. C. BANNATYNE.

HUGHES, D. L. (1954). **Some reflections on the mastitis problem.** — *Vet. Rec.* **66,** 235-239. Discussion pp. 239-240. **9**

H. discussed the incidence of mastitis in dairy cows, and gave the results of a bacteriological survey of 2,654 clinical cases, 25% of which were associated with *Streptococcus agalactiae*. He also discussed the problem of mastitis in cows from milk samples from which no micro-organisms can be isolated, various aetiological factors, and antibiotic treatment, with reference to the actual and possible results of indiscriminate use of penicillin. A general discussion followed. [See also *V.B.* **23,** 1113.]—R.M.

I. TAYLOR, J. I., HOLMAN, H. H. & PATTISON, I. H. (1950). **Studies of experimental streptococcal mastitis. II. Inoculation of varying numbers of living *Streptococcus agalactiae* into the teat canal of goats.**—*J. comp. Path.* **60,** 92-99. [Abst. from authors' summary.] **10**

II. PATTISON, I. H. & HOLMAN, H. H. (1953). **Experimental streptococcal mastitis. VIII. Further immunological studies in goats.**—*Ibid.* **63,** 304-317. [Abst. from authors' summary.] For previous parts, see *V.B.* **21,** 633, 634, 3442, 3443; **22,** 1942; **23,** 1792, and *I. supra.*] **11**

I. The inoculation into the teat canal of goats of doses of living *Str. agalactiae* varying from approx. 1,000 to 100,000 million and contained in a volume of 10 ml. produced a sharp systemic reaction that lasted two or three days, followed by mastitis that resembled streptococcal mastitis in cows.

With the strain used 45 out of 258 isolations from milk were more lethal for mice after growth in the udder. The serum of one of 13 goats tested 9 days after inoculation with *Str. agalactiae* gave increased mouse protection.

During the first 6 hours the leucocyte counts of goats inoculated with living organisms fell as an arithmetical progression.

II. Of the four Lancefield type strains of Group-B streptococci, strains Ia, Ib, and II were sufficiently lethal for mice to be used in immunity tests.

Active and passive immunity tests in mice showed that immunity was, at least in part, type-specific, but mice inoculated by the intraperitoneal route with serum or vaccine also had some non-specific immunity against subsequent intraperitoneal test doses.

In goats inoculated by the intramammary route with the four different type-strains of group-B streptococci the histological lesions of mastitis were indistinguishable from those produced by strain S 13 [*V.B.* **23,** 1792] or by *Str. dysgalactiae*, strain 419. Following a series of subcutaneous or intraperitoneal injections of a formolized whole culture vaccine prepared from a mixture of each of the four type strains of group-B streptococci, goats were challenged by intramammary injections of one of these types. Measurable protection of the udder was demonstrated for each of the four types.

MACKANESS, G. B. (1954). **Relationship between host cell and parasite in tuberculosis.**—*Brit. med. Bull.* **10,** 100-104. **12**

The ability of tubercle bacilli to survive and multiply within the host's monocytes is related to the virulence of the organisms and

varies inversely with their age and the density of the monocyte population. The problem of immunity is complicated by tissue necrosis.
—W. R. Bett.

Hussel, L. (1953). Über den Gehalt tuberkulösen Gewebes an *Mycobacterium tuberculosis*. **[The number of tubercle bacilli in tuberculous tissues.]**—*Arch. exp. VetMed.* **7**, 118-129. **13**

A discussion on the number of tubercle bacilli in TB. lesions, based on the examination of two hamsters, one g. pig and one camel.
—R. B. Holcombe.

Humbert, R. (1953). Zur Frage der Endotoxine von hitzegetöteten Tuberkelbakterien. **[Endotoxins of heat-killed tubercle bacilli.]**—*Frankfurt. Z. Path.* **64**, 133-141. **14**

Suspension of virulent tubercle bacilli, killed at 60°C., was injected into g. pigs on 9 successive days at the same subcutaneous site. The resulting abscess contained numerous tubercle bacilli in a cell-free exudate, but there was no caseation. When suspension was injected intraperitoneally there was a tendency to caseation.

In control g. pigs infected with virulent bacilli, intracutaneous tuberculin tests were made on the 27th day with tuberculin, and into the opposite flank with a mixture of streptomycin and tuberculin. There was no weakening of the reaction with the latter, both being strongly positive.—R. B. Holcombe.

Tarshis, M. S. (1954). **A simple blood medium for determining the susceptibility of *Mycobacterium tuberculosis* to isoniazid (isonicotinic acid hydrazide).** — *J. Bact.* **67**, 117-122. **15**

A solid potato-egg yolk medium containing human blood was satisfactory for the determination of susceptibility of *M. tuberculosis* to *iso*-nicotinic acid hydrazide.—R.M.

Ungar, J., Tomich, E. G., Parkin, K. R. & Muggleton, P. W. (1954). **Effect of pyridoxine on the action of isoniazid.**—*Lancet.* **267**, 220-221. [Authors' summary modified.] **16**

Side-reactions have been reported in man after *iso*-nicotinic acid hydrazide ("isoniazid") treatment and in animals after prolonged treatment with high doses of the drug. Pyridoxine in suitable dosage appears to counteract such side-effects of isoniazid in lab. animals.

Pyridoxine does not interfere with the direct antituberculous activity of the drug either *in vitro* or in infected mice.

The authors suggested that pyridoxine could be tried without adverse effect in the isoniazid treatment of patients who show signs of intolerance to the drug.

Hallinger, L. N., Silber, R. & Neumann, G. (1954). **Inhibitory effect of 5,6-dimethylbenzimidazole and of 1,2-dimethyl, 4,5-diaminobenzene on growth of *Mycobacterium tuberculosis*.**—*Proc. Soc. exp. Biol., N.Y.* **85**, 624-626. [Authors' conclusions modified.] **17**

Two compounds, 5,6-dimethylbenzimidazole and 1,2-dimethyl 4,5-diaminobenzene, which have been previously implicated in vitamin B_{12} metabolism, were found to inhibit the growth of *M. tuberculosis*, strain H37Rv, in Dubos medium.

Weimer, H. E., Redlich-Moshin, J., Boak, R. A., Bogen, E. & Carpenter, C. M. (1954.) **Serum protein studies in experimental tuberculosis of the guinea pig.** — *Amer. Rev. Tuberc.* **70**, 344-348. [French and Spanish summarries.] **18**

In g. pigs infected with the B88 strain of human type *M. tuberculosis* and treated with corticotropin and cortisone, streptomycin, and beryllium chloride, the pattern of the serum protein response was similar in three respects to that in human pulmonary TB.: decrease in serum albumin, hyperglobulinaemia, and decrease in albumin-globulin ratio. In the g. pig, unlike man, there was a statistically significant increase in total serum protein and serum globulin.—W. R. Bett.

Rice, C. E., Boulanger, P. & Konst, H. (1954.) **Parallel studies of complement and blood coagulation. XIV. In tuberculin shock.** —*Canad. J. comp. Med.* **18**, 197-206. **19**

G. pigs were infected with a strain of tubercle bacillus of moderate virulence, and B.C.G. respectively. The former were tested with homologous tuberculin the latter with human type. In the former there was a decrease in complement and lengthening of clotting time. These changes were less pronounced in the latter group.—Thomas Moore.

Cronin, M. T. I. (1954). **The attenuation of *Mycobacterium tuberculosis* var. *muris* (the vole acid-fast bacillus).**—*J. comp. Path.* **64**, 234-242. [Abst. from author's summary.] **20**

C. described a method for the attenuation of strain LV 2401 of the murine type of tubercle bacillus by repeated and rapid passage on culture medium containing bile salt and recorded the cultural changes produced in the organism during subcultivation. In pathogen-

icity tests on rabbits with two strains of the original LV 2401 culture, one passaged on plain medium and the other on bile salt medium, there were indications of some attenuation of the latter strain.

Biswal, G., Gray, M. L. & Thorp, F., Jr. (1953). **A study of *Corynebacterium renale*-like organisms isolated from cows.**—*Mich. St. Coll. Vet.* **14,** 19-25 & 33. **21**

The authors studied ten strains of diphtheroid organisms isolated from pyelonephritis in cattle by Feenstra (1945). They differed from *C. renale* in some of their biochemical properties and in the fact that all produced alpha haemolysis.—R.M.

Larson, E. J., Gray, M. L., Thorp, F., Jr. & Laine, S. L. (1954). ***In vitro* sensitivity of *Corynebacterium renale* to seven antibiotics.**—*Mich. St. Coll. Vet.* **14,** 143-145. [Author's summary copied *verbatim*.] **22**

The effect of seven common antibiotics was determined against 25 strains of *C. renale* and *C. renale*-like diphtheriods. The results suggested that penicillin or bacitracin were the antibiotics of choice for treating infections with these microorganisms. Penicillin is to be preferred because of its lower toxicity.

Seronde, J., Jr. (1954.) **Resistance of rats to inoculation with *Corynebacterium* pathogenic in pantothenate deficiency.**—*Proc. Soc. exp. Biol., N.Y.* **85,** 521-524. [Author's summary modified.] **23**

S. isolated a *Corynebacterium* from spontaneous "pseudotuberculous" lesions of pantothenate-deficient rats. In inoculation experiments the organism was not pathogenic for rats on a fully supplemented diet in doses which produced progressive disease in deficient animals. This break in resistance was demonstrable by inoculation of the organism sometimes as early as 16 days after the rats had been placed on the deficient diet, before overt deterioration in physical condition had developed.

Hartwigk, H. & Barnick, K. F. (1954.) Ein Beitrag zur Frage der Schaffung von Rotlaufbakterienträgern durch die Simultanimpfung. **[The creation of carriers of *Erysipelothrix rhusiopathiae* by immunization of pigs by the simultaneous injection of live vaccine and serum.]**—*Dtsch. tierärztl. Wschr.* **61,** 241-243. **24**

E. rhusiopathiae was isolated by mouse inoculation from the tonsils or ileocaecal folds of 88 out of 200 apparently healthy pigs at slaughter. The carrier rate was highest among pigs vaccinated by the serum simultaneous method, but since most of these were examined during June-August when the overall carrier rate was markedly higher it is unsafe to conclude that such vaccination creates carriers. —J. E. Smith.

Simmons, G. C. & Ryley, J. W. (1954.) **Ovine mastitis, with special reference to mastitis caused by *Pasteurella mastitidis*.**—*Qd. J. agric. Sci.* **11,** 29-35. [Author's summary modified.] **25**

The authors described 6 outbreaks of mastitis of sheep. Two were caused by *Past. mastitidis* and one by *Staphylococcus aureus*. In the remaining three, *Past. mastitidis* was associated with *Corynebacterium pyogenes* in one, with *Staph. aureus* in another and with *Staph. aureus* and streptococci in the third.

Leader, R. W. & Baker, G. A. (1954.) **A report of two cases of *Pasteurella pseudotuberculosis* infection in the chinchilla.**—*Cornell Vet.* **44,** 262-267. [Abst. from author's summary.] **26**

The authors reported two natural outbreaks of fatal disease in chinchillas (*Chinchilla laniger*) on a breeding farm in the U.S.A., caused by *Past. pseudotuberculosis*.

Thal, E. (1954.) Untersuchungen über Pasteurella pseudotuberculosis unter besonderer Berücksichtigung ihres immunologischen Verhaltens. **[A study of the immunology of *Past. pseudotuberculosis*.]** — *Thesis, Lund.* pp. 69. [In German. English summary] **27**

T. examined 186 strains of *Past. pseudotuberculosis* of different origin. Their biochemical characters were identical, but by means of the 'O' antigens they could be divided into 5 distinct groups which were subdivided into toxic and non-toxic strains. The exotoxin is thermolabile and can be converted into immunizing toxoid. Live cultures of non-toxic strains produce solid immunity against toxic strains in g. pigs.—W. G. Siller.

Banerji, T. P. & Mukherjee, R. (1954.) **Nutritional requirements of *Pasteurella septica*.**—*Curr. Sci.* **22,** 177-178. **28**

The authors found that pantothenic acid and nicotinamide were essential for the growth *in vitro* of two strains of *Past. septica*, one non-pathogenic and the other pathogenic for cattle. Guanine, xanthine, glutamine, inositol, pyridoxine, *p*-aminobenzoic acid, vitamin B_{12}, folic acid, choline, biotin and haematin ap-

peared to stimulate growth when added individually to cultures. Thiamine and riboflavin were not essential for growth.—R.M.

SILVERMAN, S. J., HIGUCHI, K. & MEYERS, E. (1954). **Production of protective antigens by *Pasteurella pestis* in a synthetic medium.**—*Proc. Soc. exp. Biol., N.Y.* **86,** 112-114. [Authors' summary modified.] **29**

The authors found that the soluble substances produced by *Past. pestis* when grown at 37°C. in a suitable completely defined medium are capable of producing a high degree of protection when injected into mice.

BOHNHOFF, M., DRAKE, B. L. & MILLER, C. P. (1954). **Effect of streptomycin on susceptibility of intestinal tract to experimental salmonella infection.**—*Proc. Soc. exp. Biol., N.Y.* **86,** 132-137. [Abst. from authors' summary.] **30**

Preliminary treatment by mouth with a large dose (50 mg.) of streptomycin increased the susceptibility of mice to infection following oral inoculation with a streptomycin-resistant strain of *S. enteritidis*. In those treated with streptomycin 24 hours before inoculation, less than 3 organisms sufficed to initiate infection in 50% as compared with approx. 10^5 in untreated controls. This effect of streptomycin decreased as the interval between treatment and inoculation was lengthened but was still detectable on the 5th day. With smaller doses of streptomycin (5–10 mg.) there were smaller increases in susceptibility; 1 mg. was ineffective. In representative numbers of mice killed for culture, the spleen was found to be infected in 90%, and the heart-blood in 72% of those with positive faecal cultures at the time of autopsy. It is believed that this increase in susceptibility following streptomycin treatment resulted from a disturbance of the normal intestinal microflora by the drug. This method may be applicable to the experimental study of other enteric infections.

WRIGHT, M. L., ANDERSON, G. W. & TRUSCOTT, R. B. (1954). **Non-pullorum reaction in turkeys.**—*Proc. 26th Ann. Meet. N.E. Conf. Lab. Wkrs Pullorum Dis. Contr.,* Raleigh N.C., June 14-15, 1954. pp. 3. [Mimeographed.] **31**

The authors reported that *S. pullorum* was isolated from only one out of 16 turkeys that had previously reacted to the tube agglutination test for pullorum disease. Various Gram-negative bacteria that were antigenically related to *S. pullorum* were isolated from 13 of the turkeys.— E. A. GIBSON.

EDWARDS, P. R., BROWNE, A. S., MCWHORTER, A. C. & WILLIAMS, A. (1954). **A new Salmonella serotype (9, 12: Z_{38}) isolated from turkeys.**—*Cornell Vet.* **44,** 259-261. [Authors' summary modified.] **32**

Three *Salmonella* cultures isolated from the intestinal contents of turkey poults from two different flocks were represented by the antigenic formula 9,12:Z_{38}. The H antigens were identical with those of *S. lille* and related slightly to those of *S. weslaco* and *S. macallen*.

SNOEYENBOS, G. H. & BULLIS, K. L. (1954). **Observations on the control of fowl typhoid.**—*Proc. 26th Ann. Meet. N.E. Conf. Lab. Wkrs Pullorum Dis. Contr.,* Raleigh, N.C., June 14–15, 1954. pp. 2. [Mimeographed.] **33**

The authors described the incidence of *Salmonella gallinarum* infection in Massachusetts. An eradication programme, based on the tube agglutination test, provides for the compulsory isolation and testing of affected flocks.—E. A. GIBSON.

DOUGHERTY, E. (1954). **Paratyphoid infection in the White Pekin duck.**—*Proc. 26th Ann. Meet. N.E. Conf. Lab. Wkrs Pullorum Dis. Contr.,* Raleigh, N.C., June 14–15, 1954. pp. 2. [Mimeographed.] **34**

D. reported that during a four year period, 62 strains of *Salmonella typhi-murium,* one of *S. newport* and one of *S. give* were isolated from White Pekin ducks on Long Island, New York State. He described briefly the main features of the disease.—E. A. GIBSON.

SHKLAIR, I. L. & STAFSETH, H. J. (1954). **A study of serological cross reactions between the *Brucella* and certain salmonellae. I. The antigen common to *Brucella* and *Salmonella pullorum*. II. The amount of the XII_2 antigen present in *Brucella* and *Salmonella pullorum* BAI (variant strain), *Salmonella reading,* and *Proteus* (Gwatkin strain). III. A study of sera of turkeys naturally infected with *Salmonella pullorum,* with respect to cross agglutination with *Brucella*.**—*Mich. St. Coll. Vet.* **14,** 130-135, 136-139 & 142 and 140-142. [Authors' summaries slightly modified.] **35**

I. No cross agglutination reactions were observed between *S. pullorum* 89817 and *Brucella*. In a number of cases cross reactions were noted between intermediate strain *S. pullorum* 671 and *Brucella*. Cross agglutinations were observed between variant strain *S. pullorum* BAI and *Brucella*. The antigenic structure of *S. pullorum* is IX, XII_1, (XII_2), XII_3.

From the above results it appears that the XII_2 antigen (found in the intermediate and variant strains of *S. pullorum*), or a part thereof was responsible for the observed cross reactions.

The authors discussed the importance of brucellosis in fowls.

II. Reciprocal agglutination tests were carried out between *Brucella* and other organisms, *S. reading* and *Proteus* (Gwatkin strain), which contain antigen XII_2. The cross reactions observed between these organisms and *Brucella* were less pronounced than those noted between *S. pullorum* BAI and *Brucella*. There appears to be a difference in the amount of the cross reacting antigen (for *Brucella*) in *S. pullorum* BAI, *S. reading*, and *Proteus* (Gwatkin strain). Whether this is a strain characteristic of the organisms involved is not known.

Agglutination absorption studies carried out with *S. pullorum* BAI and *Brucella* indicated that the antigen common to *S. pullorum* BAI, *S. reading*, and *Proteus* (Gwatkin strain) existed in approx. equal amounts in all 3 species of *Brucella* tested.

III. One hundred and seventy-six *S. pullorum* suspicious and reactor turkeys were tested using *Br. abortus* 2308 and *Br. melitensis* 2500 antigens in dilutions of 1:25, 1:50, and 1:100. Of this total, 29 (17%) showed a cross reaction with the *Brucella* antigens.

FERGUSON, G. S. & ROBERTSON, A. (1954). **The use of the milk ring test in a survey of the incidence of bovine brucellosis in southern Scotland.**—*J. Hyg., Camb.* **52**, 24-36. **36**

An analysis of 438 simultaneous blood serum agglutination and milk ring tests showed the milk ring test to be correct in approx. 93% of cases in detecting cows whose blood serum is positive to the brucella agglutination test. It is a simple, rapid, and reliable screening test for detecting herds possibly infected with brucella.—W. R. BETT.

GAY, K. & DAMON, S. R. (1950). **Use of the embryonating egg for isolation of *Brucella* in a public health diagnostic laboratory: a yolk sac technique.** — *Proc. IIIrd Inter-Amer. Congr. Brucellosis*, Washington, 1950. pp. 157–164. [Spanish summary.] [Abst. from authors' conclusions.] **37**

The authors described the use of chick embryos for primary isolation of brucella from the blood stream and gave supporting experimental data. The injection is made directly into the yolk sacs of 3-, 4-, and 5-day old embryos, subcultures being made periodically. All three types of brucella have been isolated and in many instances the technique proved superior to g. pig inoculation or culture.

Among other advantages of the method are its relative cheapness, saving in time and reduction of risk for laboratory personnel.

HUDDLESON, F. & WHITE, E. A. (1954). **Isolation of *Brucella abortus* Type II (Wilson) from the milk of dairy cows in one herd in Michigan.**—*Mich. St. Coll. Vet.* **14**, 120-121. [Abst. from authors' summary.] **38**

The authors isolated *Br. abortus* Type II (Wilson) for the first time from the milk of infected dairy cows in Michigan. They enumerated the characters of this type of strain.

SIMMS, B. T. (1950). **Control of brucellosis in the United States.**—*Proc. IIIrd Inter-Amer. Congr. Brucellosis*, Washington, 1950. pp. 244-251. [Spanish summary.] **39**

The various State livestock sanitary officials and the Bureau of Animal Industry are carrying out a co-operative programme for the control and eradication of brucellosis, based on (1) testing and slaughter of reactors, and (2) vaccination of heifers. Satisfactory progress is being made. The incidence among tested cattle was 7% in 1936, 5% in 1946, and 3·5% in 1950. Reduction in the incidence of brucellosis has been a factor in the great increase in beef and milk production between 1936 and 1949.

PLASTRIDGE, W. N., WILLIAMS, L. F., EASTERBROOKS, H. L., STROSS, M. D. & SMITH, J. V. (1954). **Bovine brucellosis. A review of research and control in Connecticut.**—*Bull. Storrs agric. Exp. Sta.* No. 308. pp. 14. [Abst. from authors' summary.] **40**

The authors described research on brucellosis in Connecticut and subsequent development of control programmes suited to conditions in that State. They summarized the results to date, which show that:—The incidence has been reduced by about 80% (from 20% to less than 5%) in herds maintained chiefly by replacements raised in the State. This saves local dairymen over one million dollars annually, and has reduced the incidence of human illness.

Blood tests and segregation and disposal of positive reactors are needed to eliminate the infection remaining in calfhood — vaccinated herds, and from the untested herds maintained by purchased replacements.

BRYAN, H. S. MANSFIELD, M. E. & GRAHAM, R. (1954). **Studies on bovine brucellosis immu-**

nization: controlled experiments with B.A.I. Strain 19 and Huddleson's mucoid vaccines.—*Proc. 57th Ann. Meet. U.S. live Stk sanit. Ass.* 1953. pp. 124-134. [Abst. from authors' summary.] **41**

The authors reported the results of five controlled experiments with Bureau of Animal Industry *Br. abortus* Strain 19 vaccine and Huddleson's mucoid (M) vaccine in 228 heifers, 4–8 months old.

Immunity was challenged by instillation into the conjunctival sac, using 4–14 million virulent *Br. abortus* Strain 2308 organisms per heifer, during the mid-gestation period of the first pregnancy.

Abnormal births occurred in (a) 11 of 31 Strain 19 vaccinates, (b) 27 of 34 Huddleson's mucoid vaccinates and (c) 22 of 25 unvaccinated controls. Positive reactions to the serum agglutination test (titres of 1:100 or higher) were obtained after challenge in 14, 28 and 22 animals in the 3 groups respectively. The organism was recovered in culture, and by g. pig inoculation of material from the heifer and/or its aborted foetus, from 12 out of 26 specimens from group (a), from 26 of 34 such specimens from group (b), and from 22 of 25 specimens from group (c).

Statistical treatment of results obtained in 4 of these tests with 90 pregnant heifers revealed that the M vaccine failed to provide a significant degree of resistance against brucellosis, whereas the resistance induced by Strain 19 vaccine was significant if of a relative type.

Neither an experimental streptomycin-killed *Br. suis* bacterin nor an experimental vaccine prepared from a rough-like dissociated strain of *Br. suis*, tested on 57 heifers, provided protection against challenge with *Br. abortus*.

Kuzdas, C. D. & Morse, E. V. (1954). **The survival of *Brucella abortus*, U.S.D.A. strain 2308, under controlled conditions in nature.**—*Cornell Vet.* **44,** 216-228. [Authors' summary modified.] **42**

The authors studied the survival time of *Br. abortus*, U.S.D.A. strain 2308, in nature under controlled environmental conditions. The organisms were suspended in or admixed with cattle urine, lake water, tap water, raw milk, cattle faeces, and two types of soil, and held at 37°, 25°, 8°, −3°, and −40°C. At 37°C. the lethal effect was marked while at 25°C. the organisms survived for considerable periods—much longer in some instances than anticipated. At freezing or near-freezing temperatures they survived for over 824 days.

Brucella organisms in infected g. pig tissues were exposed to cattle urine at 37° and −40°C. Carcasses of *Brucella*-infected g. pigs were placed upon the soil surface or buried under 2 feet of soil and their spleens examined at intervals for the pathogen. The organism survived longer in carcasses on the surface than in those which were buried. The climate during winter proved to be much more favourable for survival (44 days) than that in summer (one day).

I. Banfield, A. W. F. (1954). **Tularemia in beavers and muskrats, Waterton Lakes National Park, Alberta, 1952-53.**—*Canad. J. Zool.* **32,** 139-143. **43**

II. Langford, E. V. (1954). **An outbreak of tularaemia in beaver and muskrat in Waterton Lakes National Park, Alberta.**—*Canad. J. comp. Med.* **18,** 28-30. **44**

I. *Brucella tularensis* was isolated from beavers and muskrats from Waterton Lakes, National Park, Alberta, during an outbreak of tularaemia in the winter of 1952-53.

II. *Br. tularensis* infection was found responsible for unusual mortality among beaver and muskrats in Waterton Lakes National Park during the winter of 1952-53. The organism was isolated from 2 of 10 samples of water taken from streams in the Park.

—P. J. G. Plummer.

Yager, R. H., Gochenour, W. S., Jr., Alexander, A. D. & Wetmore, P. W. (1953). **Natural occurrence of *Leptospira ballum* in rural house mice and in an opossum.**—*Proc. Soc. exp. Biol. N.Y.* **84,** 589-590. [Abst. from authors' summary.] **45**

In a search in Virginia, U.S.A., for wild-life carriers of *L. pomona*, various species of mammals were trapped in an endemic area of bovine leptospirosis in that State. Direct dark-ground microscopic examinations of urine or bladder saline washings disclosed the presence of leptospira in 10 of the 37 house mice examined; the organism was isolated in culture from 9 of these 10, from 6 additional house mice and from 1 of 2 opossums, but serological typing, using 18 type leptospiral immune rabbit serums, revealed that it belonged to the serotype *L. ballum*. The failure to detect *L. pomona* in the rodent and other wild life population in an endemic area of bovine leptospirosis affords ancillary evidence that the natural hosts of *L. pomona* are to be found primarily in the livestock population. To the authors' knowledge this is the first report of leptospira from the opossum.

McEntee, K., Hughes, D. E. & Gilman, H. L. (1954). **Experimentally produced vibriosis in dairy heifers.**—*Cornell Vet.* **44,** 376-394. [Authors' summary modified.] **46**

Virgin heifers inseminated either from *V. fetus* infected bulls or with semen from uninfected bulls, to which the organism was added, required a median of 5 (range 1 to 16) services per recognizable pregnancy. The vaginal mucus titre became positive approx. 60 days after service with infected semen, and persisted so for approx. 7 months.

The mucus agglutination test was much more useful for diagnosis than the blood serum agglutination test. Approx. 25% of the oestral mucus samples of infected heifers yielded vibrios.

The majority of infected heifers experienced long oestrous cycles ranging from 27 to 53 (median 32) days.

Control heifers, which were allowed to run with the infected ones, remained healthy. The vaginal mucus did not develop a positive titre to *V. fetus* after insemination and vibrios were never isolated from these heifers. They required a median of 1 (range 1–3) services per recognizable pregnancy.

Ristic, M., Wipf, L., Morse, E. V. & McNutt, S. H. (1954). **Experimental *Vibrio fetus* infection in guinea pigs. II. Pathological aspects.**—*Amer. J. vet. Res.* **15,** 137-139. [Authors' summary modified. For part I, see *V.B.* **24,** 15.] **47**

Characteristic lesions in the uterus in g. pigs infected experimentally with *V. fetus* were epithelial sloughing, inflammatory cell reaction, haemorrhages, enlarged blood vessels, extensive myometrial and subendometrial oedema, and cystic uterine glands. The most noteworthy histological changes of the foetal tissues were haemorrhages of the myocardium and liver.

Lübke, H. (1953). Zur Frage des Wirkungsmechanismus der Ultraschallwellen bei Bakterien. **[The mode of action of ultrasonic waves on bacteria.]**—*Z. Hyg. InfektKr.* **138,** 216-223. **48**

L. exposed bacterial suspensions to the action of ultrasonic waves at 800 kilocycles and a field intensity of 9·35 W/cm². With *Bact. coli* 30% of the organisms survived exposure for 10 min. and 20% for 20 min. The addition of glucose to the bacterial suspensions increased the percentage of organisms which survived. With *Staph. aureus, Brucella abortus, Salmonella gallinarum, Pasteurella pseudotuberculosis,* and *Str. equi* the percentage of organisms surviving after 10 min. exposure was 16%, 24%, 30%, 21% and 20%, respectively. L. concluded that the mode of action of ultrasonic waves on bacteria is more mechanical than chemical or thermal.—R.M.

Hurni, H. (1954). Bakterizide Wirkung und Oberflächenspannung quaternärer Ammoniumsalze. **[Bactericidal action and surface tension of quaternary ammonium compounds.]**—*Schweiz. Z. Path.* **17,** 194-200. [English and French summaries. English summary slightly modified.] **49**

A series of homologous derivatives of p-lauryl - ethoxy - dimethyl - benzyl - ammonium chloride ("fortasept") with alkyl chains of varying length were tested for bactericidal action. This was shown to bear no direct relationship to the surface tension. The uptake of disinfectant by the bacteria was assessed by measuring the decrease in surface tension in the course of the bactericidal process: it was found to be smallest for the substance with the highest bactericidal effect. The variation in surface tension did not reveal the existence of certain phases in the disinfectant action, *e.g.* an initial adsorption followed by protein denaturation.

Werner, C. A., Knight, V. & McDermott, W. (1954). **Studies of microbial populations artificially localized *in vivo* I. Multiplication of bacteria and distribution of drugs in agar loci.**—*J. Clin. Invest.* **33,** 742-752. [Authors' summary slightly modified.] **50**

The authors described a method whereby they successfully localized a bacterial population in the peritoneal cavity of an animal host for varying periods of time. The bacteria were localized in the central portion of triple-layered 3% agar discs and were completely isolated by surrounding transparent agar. As no nutriment was added to the agar, the bacteria were dependent for growth on nutritive substances from the surrounding tissue fluids and were able to exist in a state more closely approximating true parasitism than is possible *in vitro*. The tissue reaction to the agar discs in the peritoneal cavity resembled a foreign body reaction.

Exudate containing inflammatory cells lined the surface of the discs, but the cells were not able to penetrate the substance of the agar.

Pathogenic bacteria were tested for their ability to grow in several animal species in this situation. Staphylococci, typhoid bacilli, Friedländer's bacilli, and anthrax bacilli grew luxuriantly in agar discs in rabbits, g. pigs,

and cats, although growth had been negligible in unenriched agar *in vitro*. Streptococci, enterococci, pneumococci, and brucella also grew well in agar discs *in vivo*, although the colonies sometimes attained only microscopic size. Contamination of the peritoneal cavity occurred in less than 25% of trials.

The agar discs were well penetrated *in vitro* and *in vivo* by penicillin, streptomycin, chlortetracycline (aureomycin), and chloramphenicol.

THOMAS, L. (1954). **Cortisone and infection.**—*Ann. N.Y. Acad. Sci.* **56,** Art 4. pp. 799-814. **51**

The effects of cortisone on response to bacterial infection and on the action of Gram-negative bacterial toxins can be imitated, during a crucial period of time, by colloidal materials such as thorotrast, trypanblue, Indian ink, or iron saccharate, capable of producing reticulo-endothelial 'blockade'. It is suggested that cortisone interferes with the normal capacity of the r.e.s. to fix and detoxify bacteria, so that this function may be shifted to tissues not normally concerned with it.

—W. R. BETT.

TUCKER, E. W. (1954). **Case reports on yeast infections of the bovine udder.**—*Cornell Vet.* **44,** 79-85. **52**

A general account of mastitis in cows caused by a yeast-like organism, with reports of 7 representative cases, 2 of which were traced to the use of contaminated infusion equipment. In most cases the infection is self-limiting, though occasional fatal infections have occurred.—F.E.W.

BLAXLAND, J. D. & MARKSON, L. M. (1954). **Observations on the transmissibility and pathogenesis of moniliasis in turkey poults.**—*Brit. Vet. J.* **110,** 139-145. [Authors' summary slightly modified.] **53**

[This abst. replaces abst. 3458 which proved to require modification.]

The authors carried out two experiments and a field survey in an attempt to elucidate the aetiology and pathogenesis of moniliasis in turkey poults. Enteral and parenteral administration of a culture of *Candida albicans* produced infection in most of the inoculated and in-contact poults and sub-clinical moniliasis in a few of them. Administration of a suspension of crop scrapings from field cases of the disease produced similar results. There was no evidence of the presence of an endotoxin in the yeast. None of the birds in these experiments developed symptoms of moniliasis. The field survey demonstrated that *C. albicans* may be present in birds as a commensal and may even cause gross lesions in the crop, without any sign of clinical disease.

CANTONI, O. & MOLINARI, P. (1954). Actinomicosi canina — sul valore terapeutico della idrazide dell'acido isonicotinico. **[Treatment of actinomycosis in a dog with *iso*-nicotinic acid hydrazide.]**—*Atti. Soc. ital. Sci. vet. Cortina d'Ampezzo,* 1953. **7,** pp. 788-796. [English and French summaries.] **54**

The authors described a persistent abscess of the lumbar region of a dog, which did not respond to various local treatments and to sodium iodide *per os*. *Actinomyces* was demonstrated microscopically in the lesion. The condition cleared up following 4 s/c injections of 0·1–0·3 g. of *iso*-nicotinic acid hydrazide, accompanied by irrigation of the lesion with iodine soln.—R.M.

LECCE, J. G. & SPERLING, F. G. (1954). **The isolation and identification of pleuropneumonia-like organisms, with special reference to chronic respiratory disease of chickens.**—*Proc. 26th Ann. Meet. N.E. Conf. Lab. Wkrs Pullorum Dis. Contr.*, Raleigh, N.C., June 14-15, 1954. pp. 8. [Mimeographed.] **55**

The authors gave a detailed account of their techniques for the isolation, identification and subculture of pleuropneumonia-like organisms (PPLO). They preferred to use 1:2000 thallium acetate rather than penicillin for the inhibition of contaminating bacteria in the primary cultures. They considered the trachea to be the best site for the isolation of PPLO from cases of chronic respiratory disease of fowls. Tracheal swabs may be taken during life.—E. A. GIBSON.

JACOBS, R. E., LUGINBUHL, R. E., BURR, W. E. & JUNGHERR, E. L. (1954). **Serologic testing for chronic respiratory disease of field respiratory cases.**—*Proc. 26th Ann. Meet. N.E. Conf. Lab. Wkrs Pullorum Dis. Contr.*, Raleigh, N.C., June 14–15, 1954. pp. 3. [Mimeographed.] **56**

The tests used were a haemagglutination, a haemagglutination inhibition, a tube agglutination, and a rapid plate test. A pleuropneumonia-like organism was used in the preparation of the antigens.

The H.I. test was considered to be the most sensitive and the rapid plate test was a "relatively accurate method" for the detection of chronic respiratory disease in fowls.

—D. LUKE.

SULLIVAN, J. F., THOMPSON, C. H., JR. & FOSTER, N. M. (1954). **Artifacts in the propagation of strains of chronic respiratory disease agents and strains of turkey sinusitis agents** *in vitro*.—*Proc. 26th Ann. Meet. N.E. Conf. Lab. Wkrs Pullorum Dis. Contr.*, Raleigh, N.C., June 14–15, 1954. pp. 5. [Mimeographed.] **57**

Using chick embryo-propagated strains of the agent of chronic respiratory disease of fowls attempts were made to propagate the agent in solid media. Two different types of growth appeared which were easily maintained. It was concluded that these structures were in the nature of artefacts since they appeared in media containing 5% formol and were recovered from broth autoclaved for 30 min. The authors considered the growths to be due to fragments of crystals in the media serving as "seed" for further crystal formation.

—D. LUKE.

LÜCK, H. (1954). Einfluss von komprimiertem Sauerstoff auf einige Stoffwechselvorgänge in Bakterien. [**Effect of compressed oxygen on bacterial metabolism.**]—*Schweiz. Z. allg. Path.* **17,** 106-117. [English and French summaries. Abst. from English summary.] **58**

The authors studied the influence of oxygen under high pressure on bacterial metabolism *in vitro*. Proteolytic enzymes, lipase and catalase were not inhibited at 130 lb./sq. inch oxygen pressure. Alkaline phosphatase under these conditions showed a higher inactivation during the breaking down of the substrate. Bacteria grown in oxygen under pressure had increased catalase activity. Dehydrogenase was irreversibly inactivated by oxygen under a pressure of 3 atmospheres. Similarly there was inhibition of lactic acid and carbon dioxide production. The bacteriostatic effect of compressed oxygen is caused by blockade of the oxidation-reduction potential of the bacterial cell.

See also absts. **135** (experimental transmission of fowl cholera by mites); **218** (food poisoning in England and Wales); **251** (chemistry of acid-fastness); **259** (report, Civil Veterinary Dept., Punjab, India).

DISEASES CAUSED BY PROTOZOAN PARASITES

MCHARDY, G. & FRYE, W. W. (1954). **Antibiotics in management of amebiasis.**—*J. Amer. med. Ass.* **154,** 646-651. [Authors' summary modified.] **59**

The authors attempted a composite evaluation of the amoebacidal efficacy of the antibiotics. They re-emphasized the difficulty of *in vitro* estimates. Despite the inaccuracies obvious in most clin. reports, they must be the basis for true therapeutic evaluation. A dosage schedule should be worked out on a more accurate basis for each antibiotic under trial as an amoebacide. Of the broad-spectrum antibiotics, oxytetracycline (terramycin) is the drug of choice in intestinal amoebiasis. Chlortetracycline (aureomycin) is less efficient. Fumagillin (fumadil), obviously a direct-acting antibiotic because of its restricted bacterial spectrum, is an efficient amoebacidal substance. There is some evidence that combined therapy may be more efficient than any antibiotic alone because of the distinct difference in mode of action and the depicted therapeutic limitation. Hepatitis, hepatic abscess, and other extracolonic amoebic involvements were not benefited by treatment with the antibiotics.

KARIB, A. A., FORD, E. J. H. & WILMSHURST, E. C. (1954). **Studies on ethidium bromide. V. The treatment of cattle infected with resistant strains of** *Trypanosoma congolense*.—*J. comp. Path.* **64,** 187-194. [Abst. from authors' summary.] **60**

Cattle infected with a strain of *T. congolense* resistant to dimidium bromide at 1·5 mg./kg. were cured by ethidium bromide at 1·0 mg./kg. Cattle infected with a strain of *T. congolense* resistant to antrycide methyl sulphate at 5·0 mg./kg. were cured by ethidium bromide at 2·0 and 5·0 mg./kg. With a strain of *T. congolense* resistant to ethidium bromide at 1·0 mg./kg. ethidium bromide at 5·0 mg./kg. was effective, but when antrycide at 5·0 mg./kg. was used, one out of 6 animals relapsed: it was cured by ethidium bromide at 5·0 mg./kg.

For the purpose of this experiment the criterion for cure was freedom from blood infection during 16 weeks of daily examination.

CANTRELL, W. (1953). **Diminished P^{32} assimilation by** *Trypanosoma equiperdum* **in the rat late in the infection.**—*J. infect. Dis.* **93,** 219-221. **61**

Assuming that rate of growth in trypanosomes is a measure of rate of reproduction C. suggested that the diminishing rate of increase in numbers at the end of infection is due to an inhibition of growth and not to destruction of a part of the population.—D. POYNTER.

MOYNIHAN, I. W. (1954). **Trichomonas disease of cattle: observations in British Columbia.**—

Canad. J. comp. Med. **18,** 149-151. 62

Following abortions in a herd of cattle, trichomonads were demonstrated in aborted foetal membranes by microscopic examination and culture. The bull and 3 cows with a persistent discharge were sold for slaughter, and all the remaining animals in the herd were douched *per vaginam* "at least once" with 100 ml. of a 1:500 solution of iodine, were given sexual rest for 3 months, then mated to a healthy test-mated bull. Normal pregnancy resulted.—THOMAS MOORE.

FITZGERALD, P. R., HAMMOND, D. M. & SHUPE, J. LEG. (1954). **Studies on the role of trichomonads in the production of atrophic rhinitis in pigs.**—*Cornell Vet.* **44,** 302-310. [Abst. from authors' summary.] 63

Trichomonads were grown in culture from the nose, stomach, and caecum of pigs. In 2 pigs, approx. 9 weeks old, given repeated nasal inoculations of bacteria-, yeast-, and mould-free nasal trichomonad cultures there were no abnormalities in the nose at the end of 40 days after the first inoculation, and only a few trichomonads could be found in the nasal cavity at this time. In 6 pigs in which similar inoculations were started when they were 7 to 9 days old, there were no abnormalities in the nose 40-42 days after the first inoculation and no trichomonads could be found in the nasal cavity. In 2 pigs about 15 weeks old, each given a single intranasal inoculation of fresh caecal contents containing trichomonads, there were no nasal abnormalities after 35 days and no trichomonads were found in the nose. Trichomonads were found in the stomach in 2 of the 8 pigs inoculated with nasal trichomonads, but not in any of the others. Trichomonads were found in the caecum in 5 of the 8 pigs inoculated with nasal trichomonads, in the 2 pigs inoculated with caecal contents, and in the 4 controls inoculated with saline solution or uninoculated.

WIRTSCHAFTER, S. K. (1954). **Evidence for the existence of the enzymes hexokinase and aldolase in the protozoan parasite *Trichomonas vaginalis*.**—*J. Parasit.* **40,** 360-362. [Author's discussion modified.] 64

This initial study dealing with the intermediary metabolism of *Tr. vaginalis* furnished evidence that the preliminary stages of carbohydrate utilization have the same characteristics as do those of vertebrate tissue and yeast. This study is the first to indicate that the parasitic flagellates of warm blooded vertebrates found outside of the blood stream also possess a phosphorylative mechanism for utilization of carbohydrate. Further experiments, to be reported later, dealing with the anaerobic utilization of carbohydrates, confirmed these findings.

KELLY, D. R., SCHUMACHER, A. & SCHNITZER, R. J. (1954). **Experimental studies in trichomoniasis. III. Influence of the site of the immunizing infection with *Trichomonas vaginalis* on the immunity of mice to homologous reinfection by different routes.**—*J. Immunol.* **73,** 40-43. [Authors' summary modified.] 65

Intramuscular or intra-abdominal immunization of mice with live cultures of *Tr. vaginalis* produced marked protection against re-infection by both these routes, but the immunity against subcutaneous reinfection was much less pronounced. Immunization of mice by the subcutaneous route conferred immunity against intramuscular re-infection, but not against re-infection by the subcutaneous or the intra-abdominal routes. The healing of the primary subcutaneous lesion was followed by a period of residual immunity of at least 4 weeks' but less than 7 weeks' duration.

HARRISON, A. P., JR. & HANSEN, P. A. (1954). **Characterization of the Lactobacteriaceae encountered as secondary invaders in blackhead liver lesions of turkeys.**—*Zbl. Bakt. I.* (*Orig.*) **161,** 125-137. [In English.] 66

The authors gave a detailed description of the strains of streptococci and lactobacilli that they isolated from blackhead lesions in the liver of turkeys. The streptococci included *Str. faecalis, Str. inulinaceus, Str. liquefaciens,* a strain that resembled *Str. lactis,* and several unidentified cocci related to the genus *Pediococcus. Lactobacillus fermenti, L. acidophilus* and *L. bifidus* were isolated from liver lesions. *L. plantarum* was found in the healthy caeca of most turkeys, but could not be isolated from the liver lesions.—E. A. GIBSON.

SHELTON, G. C. (1954). **Giardiasis in the chinchilla. I. Observations on morphology, location in the intestinal tract, and host specificity. II. Incidence of the disease and results of experimental infections.**—*Amer. J. vet Res.* **15,** 71-74 & 75-78. [Author's summaries modified.] 67

I. Detailed morphological studies were made of the *Giardia* organism in the chinchilla (*Chinchilla laniger*) in an attempt to determine its relation to *Giardia* species of other animals. The trophozoite of the chinchilla showed a marked uniformity in size with an average length of 15·37 and width of 9·24 μ. A decided morphological difference between the trophozoite of the chinchilla and that of *G. muris* was noted. The

greatest concentration of trophozoites found in the chinchilla were in the first 24 in. of the small intestine. Most of the cysts were concentrated in the caecum. Attempts to infect chinchillas with *G. canis* of the dog and *G. muris* of the mouse were unsuccessful. *Giardia* of the chinchilla did not survive in white mice, although excystation did occur following the oral administration of viable cysts.

II. A survey for incidence of *Giardia* infection at a chinchilla ranch revealed that 21% of the cages housed infected animals.

Eight *Giardia*-free chinchillas were given oral doses ranging from 280,000 to 900,000 *Giardia* cysts. Infection was established in all animals, but in one the infection was apparently self-limiting. Three of the 8 animals died within 45 days. All these three developed heavy *Giardia* infections accompanied by abnormal faecal eliminations a few days before death. S. described the symptoms and P.M. findings.

Limited observations from this study suggested that reinfection from contact with contaminated faeces may account for the extreme *Giardia* populations sometimes developed.

The prepatent periods for *Giardia* in the chinchilla ranged from 6 to 11 days and the encystment cycle was found subject to wide fluctuations. The interval between periods of maximum cyst output usually varied between 5 and 9 days unless the infection was extremely heavy.

DÉOM, J. & MORTELMANS, J. (1954). Observations sur la coccidiose du porc à *Eimeria debliecki* au Congo belge. [*E. debliecki* **causing coccidiosis in pigs in the Belgian Congo**].—*Ann. Soc. belge Méd. trop.* **34,** 43-46. [English and Flemish summaries.] **68**

An outbreak of disease associated with considerable loss in young pigs in the Belgian Congo was considered to be due to *E. debliecki*. Two sizes of oocyst measuring $21{\cdot}77 \times 28{\cdot}90\ \mu$ and $13{\cdot}50 \times 16{\cdot}20\ \mu$ were recovered. The clin. symptoms included diarrhoea, rapid emaciation and constipation in the final stages.

—S. BRIAN KENDALL.

SCHOOP, G., WAGNER, K. H. & MINNERS, P. (1954). Der Vitamin-A-Mangel als prädisponierender Faktor für die Kükenkokzidiose. **[Vitamin A deficiency as a predisposing factor in coccidiosis of fowls.]**—*Mh. Tierheilk.* **6,** 154-166. **69**

The authors fed vitamin A supplements in oil, emulsion, powder and synthetic form to 102 cockerels. The birds' resistance to subsequent *Eimeria* (mainly *E. tenella*) infection was evident when compared with 42 vitamin A deficient controls by the more marked loss of weight, more severe symptoms, and higher mortality in the control groups.—M. L. CLARKE.

MILLER, J. G. (1954). **The production and identification of an anaplasmosis complement-fixing antibody.**—*Amer. J. vet. Res.* **15,** 147-148. [Author's summary modified.] **70**

An anaplasmosis complement-fixing antibody was produced in rabbits by the use of the anaplasmosis c.f. test antigen. Concurrently produced complement-fixing antibodies for r.b.c. matrices were removed by means of adsorption to permit the identification of the complement-fixing antibodies for the anaplasmosis antigen.

EYLES, D. E. (1954). **Serologic response of white rats to *Toxoplasma* infection.**—*J. Parasit.* **40,** 77-83. **71**

Of 17 rats inoculated i/p with a strain of *Toxoplasma* isolated from a wild rat 13 developed a parasitaemia. All were positive to the Sabin-Feldmann test for varying periods commencing from the 4th–7th day after inoculation, with a peak titre at about the 15th day.

—M. L. CLARKE.

HEDQVIST, T. (1953). **Toxoplasma infection at different ages by the skin-test method.**—*J. Hyg. Camb.* **51,** 478-482. **72**

The frequency in human beings of positive reactions to the skin test for *Toxoplasma* infection, low in children, rose to 40% in the age group 30–45. H. discussed the possible existence of extrahuman reservoirs of infection and transfer by vectors or food.—D. POYNTER.

CAIN, H. (1953). Encephalitis und Toxoplasmose. **[Encephalitis and toxoplasmosis.]**—*Frankfurt. Z. Path.* **64,** 171-184. **73**

An account of a fatal case of encephalitis caused by toxoplasma infection in an 8-month-old child, which was observed for 5 months, with a description of the lesions found P.M. and of the histological findings. Excessive deposition of fat in the foci of granulation and oedema in the adventitious layers of numerous vessels were specially noteworthy. The mother gave a negative reaction to the Sabin-Feldmann test up to one year after the birth of the child.

—R. B. HOLCOMBE.

AWAD, F. I. (1954). **A new dye test for *Toxoplasma* and *Sarcocystis* infections by use of *Sarcocystis tenella* spores.**—*Trans. R. Soc. trop. Med. Hyg.* **48,** 337-341. [Author's summary modified.] **74**

The author described a modification of the

Sabin-Feldmann test using spores of *Sarcocystis tenella*. The results indicated that *S. tenella* spores can be used for the diagnosis of infections with both *Toxoplasma* and *Sarcocystis*: the "cytoplasm-modifying antibody" produced by *Toxoplasma* was shown to react with spores of *S. tenella*.

Holz, J. (1954). Über die Morphologie der *Sarkocystis tenella*. [**Morphology of *Sarcocystis tenella*.**]—*Mh. Tierheilk.* **6**, 166-172. **75**

Sarcosporidia of ovine origin were observed by means of dark-ground illumination and by phase-contrast microscopy after incubation in broth and other media. Development proceeded on solid media in a special tubular apparatus. H. regarded the organisms as fungi and described motile round forms (without visible organs of locomotion) as arising from Rainey's corpuscles, and these, in turn, either multiply to form new Rainey's corpuscles directly or divide into spore-like bodies by budding. These then divide to form Rainey's corpuscles.

—M. L. Clarke.

Richey, D. J. (1954). **Leucocytozoon disease of turkeys.**—*Proc. 26th Ann. Meet. N.E. Conf. Lab. Wkrs Pullorum Dis. Contr.*, Raleigh, N.C., June 14-15, 1954. pp. 1. [Mimeographed.] **76**

R. described an investigation which is being made into the epidemiology of *Leucocytozoon* disease of turkeys. No effective control measures have yet been found.—E. A. Gibson.

Pliess, G. (1953). Die Pneumocystis Carinii und ihre Bedeutung bei der interstitiellen plasmacellulären Säuglingspneumonie. [**Role of *Pneumocystis carinii* in interstitial plasma cell pneumonia in unweaned babies.**—*Frankfurt. Z. Path.* **64**, 185-208. **77**

From 22 cases of interstitial plasmacellular pneumonia due to *P. carinii* in unweaned babies the infectious character of the condition was demonstrable. P.M. examination revealed considerable lesions in the lungs. In the literature on *P. carinii* in animals, P. found only one account (Carini & Maciel, 1914) of symptoms and lesions caused by the parasite, in a dog with persistent cough in which there was hyperaemia of the lungs.—R. B. Holcombe.

See also abst. **259** (report, Civil Veterinary Dept., Punjab, India).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

Sangat. (1953). Tentang penjakit aphtae pada sapi di Lembang (Bandung) dalam tahun 1952. [**Foot and Mouth disease in Indonesia.**]—*Hemera zoa.* **60**, 27-37. [In Indonesian. English, French and German summaries.] **78**

An account of an outbreak of F. & M. disease, type O, in 4 dairies (899 cattle) in Java. Of the 52 cattle which had been imported from the Netherlands, having been vaccinated before shipment, 8 remained healthy, whereas the 847 indigenous cattle all contracted the disease and 74 died.—C. A. van Dorssen.

Verge, J. & Placidi, L. (1953). A propos des réinfections lors de fièvre aphteuse. [**Re-infection in foot and mouth disease.**]—*C. R. Soc. Biol., Paris.* **147**, 1010-1012. **79**

Inoculation experiments on a large scale and involving 1,130 cattle confirmed the view that receptivity to infection is greatly increased by a primary sensitizing dose of virus, given a fortnight before the infective dose.

—G. V. Laugier.

Czarnowski, A., Drewniak, A. & Kawecki, Z. (1954). Przypadki pryszczycy u ludzi wywołane wirusem typu "C". [**Foot and mouth disease in man caused by type C virus.**]—*Méd. vét., Varsovie,* **10**, 199 - 201. [In Polish.] **80**

F. & M. disease was suspected among children in Poland and serological typing confirmed F. & M. disease virus type C. Six days later the same type of F. & M. disease virus was confirmed among cattle.

The symptoms in children were:—rise in temperature, appearance of vesicles of the size of a pea on the fingers and toes (corresponding to vesicles on the coronary groove in animals). Vesicles filled with serous material were noted on the tongue, gums and on the mucous membranes of the lips and cheeks. Regional lymph nodes were swollen.—J. R. Mitchell.

Salomon, Louis, Salomon, Léone, & Doucet, M.-P. (1954. Identification des types de virus aphteux par la technique de la déviation du complément sur plaques. [**Complement fixation in typing strains of foot and mouth disease virus.**]—*Bull. Off. int. Epiz.* **41**, 106-112. **81**

The authors described a technique involving the use of plates in complement fixation. Glass plates, 27·5 cm. × 38 cm. and 0·6 cm. thick and containing 40 oval depressions were used for the typing of A, O and C strains. They claimed

that the results were identical with those obtained by tube testing and that the method saved time and materials.—G. V. Laugier.

Thomas, J. A. (1953). Etablissement d'une relation entre les variations des propriétés du virus aphteux cultivé *in vivo* sur embryome électif, et les stades d'évolution clinique de la fièvre aphteuse: individualisation du stade optimum pour la préparation des vaccins. **[Relationship between the changes in the properties of foot and mouth disease virus cultured *in vivo* and the clinical stages of the disease. Determination of the optimum stage for the preparation of vaccines.]**—*C. R. Acad. Sci., Paris.* **237,** 1186-1189. **82**

T. described 7 clinical stages of F. & M. disease in cattle used for the culture of virus *in vivo* by way of specific "embryomas" [see *V.B.* **23,** 1883, 2518 & 2519]. Highly virulent strains of O and C virus were used. Titration of virus at each clinical stage showed that the optimum time for the collection of virus was early in the disease syndrome.—G. V. Laugier.

Kowalczyk, T. & Brandly, C. A. (1954). **Experimental infection of dogs, ferrets, chinchillas, and hamsters with vesicular stomatitis virus**—*Amer. J. vet. Res.* **15,** 98-101. [Authors' summary modified.] **83**

Susceptibility of domestic and lab. species to vesicular stomatitis virus (VSV) by different routes of exposure was investigated. Hamsters, chinchillas (*Chinchilla laniger*), and ferrets were all easily infected by intranasal instillation, and proved sensitive also to intracerebral exposure. Hamsters and chinchillas developed fatal encephalitis while some of the ferrets recovered. The ferrets developed lesions on the foot pads after intracerebral inoculation.

All three species were susceptible to intranasal instillation. The hamsters and chinchillas died after infection by this route whereas the ferrets survived. Neither hamsters nor chinchillas showed signs of generalization of the infectious process such as occurred in ferrets.

Dogs were resistant to intramucosal, intravenous, and intracerebral infection with the Wisconsin strain. Their experimental exposure had not been reported previously.

Hecke, F. (1952). Erfahrungen mit der Wutschutzimpfung der Hunde in Österreich. **[Immunization of dogs against rabies in Austria.]**—*Arch. exp. VetMed.* **6,** Suppl. pp. 119-124. **84**

In 1949 rabies was prevalent amongst wild mammals in that part of Austria north of the Danube. During the period 1949 to April 1952 there were 646 reported cases of rabies, 90 of which were in domestic animals, and 472 of which were in foxes. Attempts to destroy all foxes in the affected area having failed, vaccination of dogs was started in autumn 1950, using a phenol-glycerol vaccine prepared from horse brain. Post-vaccination rabies was confirmed in 12 out of 29,558 dogs vaccinated, and paralysis in 7 dogs. In autumn 1951, 28,868 dogs were vaccinated, 8,429 with the type of vaccine previously employed, 5,905 with adsorbate vaccine prepared from dog brain, and 12,438 with adsorbate vaccine prepared from horse brain. Post-vaccination rabies was reported in only 2 dogs, but the incidence of paralysis was much higher than in the previous year: 0·18%, 0·35% and 3·6% respectively of dogs vaccinated with each of the three types of vaccine developed paralysis. [See also *V.B.* **24,** 1095.]—R.M.

Koprowski, H. & Black, J. (1954). **Studies on chick-embryo-adapted rabies virus. VII. Immunological responses of animals to vaccination with high egg passage Flury strain.**—*J. Immunol.* **72,** 503-510. [Authors' summary copied *verbatim.*] **85**

The Flury strain at its high egg passage levels was found to immunize adult mice injected intra-cerebrally against challenge with street virus. Parenteral administration of the virus to mice failed to stimulate a uniform immunity response. No major antigenic differences were observed between the low and high egg passages of the virus. A single administration of the latter induced immunity in dogs, calves, monkeys and chimpanzees. Brief comment was made about these findings.

Reagan, R. L., Delaha, E. C. & Brueckner, A. L. (1954). **Response of the cave bat to several strains of rabies virus.**—*Cornell Vet.* **44,** 318-321. [Authors' summary copied *verbatim.*] **86**

Six strains of rabies virus were successfully transmitted to the cave bat by the following methods of inoculation: subcutaneously (near the neck), intranasally, and intracerebrally. The virus was confirmed to be that of rabies by mouse inoculations and by the demonstration of Negri bodies in mouse brains.

Field, E. J. (1954). **Microglial reaction in rabic infection of the mouse and rabbit.**—*J. comp. Path.* **64,** 213-216. [Author's summary modified.] **87**

F. made a comparative study of the microglial reaction in rabies encephalitis in the mouse and the rabbit. Whilst it is a prominent feature of the pathological process in the rabbit, begin-

ning when nerve cell damage is possibly absent or only minimal as judged from the Nissl picture, and going on to lamellar cell formation in the advanced stages of the disease, in the mouse there is no generalized microglial reaction. Only along the track of the injecting needle is there a reaction and this is identical with that found in control puncture wounds. He discussed some theoretical considerations of microglial function.

SOEKAWA, M. & KASHIKURA, N. (1953). **On the action of the nitrogen mustard to rabies virus.**—*Kitasato Arch.* **26,** 75-82. [In English.] **88**

The authors studied the inactivation of fixed rabies virus by nitrogen mustard (methyl-bis(beta-chloroethyl) amine hydrochloride) in suspensions of rabbit or goat brain. A vaccine containing 0·1% nitrogen mustard and 20% brain emulsion was inactive and gave a good immunity to rabies in mice.—R.M.

I. CARSON, R. S. & FRISCH, A. W. (1953). **The inactivation of influenza viruses by tannic acid and related compounds.**—*J. Bact.* **66,** 572-575. **89**

II. FRISCH, A. W. & CARSON, R. S. (1953). **Mode of inactivation of influenza virus by tannic acid.**—*Ibid.* 576-580. **90**

I. The amount of neutralized, filtered tannic acid required to inactivate strain PR 8 influenza virus was 0·001 mg. per 100 $I.D._{50}$ of virus *in vitro* and 0·5 mg. per 100 $I.D._{50}$ *in vivo,* in fowl embryos. The acid was injected into the allantoic cavity of the embryo 30 min. after the virus. Digallic acid and some crude tannins obtained from various trees had a similar action.

II. Tannic acid appeared to inactivate extracellular influenza virus, but not intracellular virus. The mode of inactivation was probably precipitation of protein.—R.M.

RHEINS, M. & FINLAY, J. (1954). **The effect of ultrasonic irradiation on certain properties of influenza virus.**—*J. infect. Dis.* **95,** 79-85. [Authors' summary slightly modified.] **91**

Influenza virus in chorioallantoic fluid was not inactivated by ultrasonic treatment at temperatures of less than 30° and at 50°C.

Influenza virus, partially purified by elution from erythrocytes into saline, demonstrated a decreased infectivity when treated at temperatures rising to 50°C. This inactivation was not accompanied by apparent changes in antigenicity nor was there loss of haemagglutinability.

Temperature readings made while ultrasonically treating infectious chorioallantoic fluid and eluted virus revealed that the internal temp. of the latter preparation reached 50°C. in half the time of exposure required for the chorioallantoic fluid.

Liberation of virus from chorioallantoic membranes was accomplished by ultrasonic irradiation within 1 min. The quantity of virus freed was equal to that obtained by grinding and was not increased by ultrasonic exposure for 5 min.

YOUNGNER, J. S. (1954). **Monolayer tissue cultures. II. Poliomyelitis virus assay in roller tube cultures of trypsin-dispersed monkey kidney.**—*Proc. Soc. exp. Biol., N.Y.* **85,** 527-530. [Author's summary modified.] **92**

Y. described the preparation of roller tube cultures of trypsin-dispersed monkey kidney cells and their utilization for the assay of poliomyelitis viruses. He presented data showing that such cultures are more sensitive indicators of the presence of poliomyelitis virus infectivity than are cultures prepared from minced kidney fragments.

GORET, P., JOUBERT, L., MARTIN, L.-A. & LEFEBVRE, R. (1952-53). Absence d'immunité croisée entre le virus de Carré et le virus poliomyélitique chez le furet. Transmission probable au furet du virus poliomyélitique (souche Lansing). [**Absence of cross-immunity between the viruses of dog distemper and poliomyelitis. Probable transmission of poliomyelitis virus to the ferret.**]—*Bull. Soc. Sci. Vét. Lyon.* **54** & **55,** 351-362. **93**

In 4 experiments involving a total of 71 ferrets the authors were unable to detect immunity to distemper virus in ferrets which had survived inoculation with "Lansing" and "W.W." strains of poliomyelitis virus. Both of these strains caused death with nervous symptoms in a number of the ferrets inoculated.

In further experiments passaging the Lansing strain in ferrets they noted that they were particularly susceptible in April, and comparatively resistant from December to January. The incubation period became shorter with passage. The authors described symptoms.—A.S.

ENRIGHT, J. B. & SADLER, W. W. (1954). **Presence in human sera of complement fixing antibodies to virus of sporadic bovine encephalomyelitis.**—*Proc. Soc. exp. Biol., N.Y.* **85,** 466-468. [Abst. from authors' summary.] **94**

The authors demonstrated the presence of complement-fixing antibodies to the virus of sporadic bovine encephalomyelitis in 75 out of 488 samples of human serum; 51 of these had

relatively high titres. They suggested that sporadic bovine encephalomyelitis is yet another disease of animals, the causative agent of which is transmissible to man.

BURROUGHS, A. L. & BURROUGHS, R. N. (1954). **A study of the ecology of Western equine encephalomyelitis virus in the upper Mississippi river valley.**—*Amer. J. Hyg.* **60,** 27-36. [Authors' summary modified.] **95**

Because of the history of epizootics and epidemics of western equine encephalomyelitis in the Upper Midwest of the U.S.A., the authors studied the ecology of the virus in an area of Minnesota which had the highest incidence of reported equine encephalomyelitis in the State during the preceding 10 years. The studies were continued through 2 years in an inter-epizootic period. Nearly 50,000 mosquitoes and hundreds of thousands of mites were used in isolation studies. Four strains of western equine encephalomyelitis virus were isolated from the much-incriminated *Culex tarsalis,* and one strain from *Aedes vexans.* Studies made of the feeding habits of a limited number of the mosquitoes are listed.

Virus neutralization tests were made with 349 sera from domestic animals, of which 18% were considered positive for neutralizing antibodies, 12% doubtful and 70% negative. Of 472 wild animal sera, all but 3 of which were avian, 5% were positive, 12% doubtful and 83% negative.

STARRAK, E. S. (1954). **Treatment of equine encephalomyelitis.**—*Canad. J. Comp. Med.* **18,** 274. **96**

Fourteen of 15 horses with equine encephalomyelitis recovered completely after treatment with anti-haemorrhagic septicaemia serum of bovine origin. Serum was given i/v at the rate of 10 to 15 ml. per min. until symptoms of foreign protein shock appeared.

—R. GWATKIN.

SCHOOP, G. (1953). Diagnostic de l'anémie infectieuse des équidés. **[Diagnosis of equine infectious anaemia.]**—*Bull. Off. int. Epiz.* **39,** 703-707. **97**

Sublingual petechiae were present in 19 out of 21 horses with E.I.A. In 10 of these horses there were fewer than 50 petechiae; in 7 of them there were more than 200. Sublingual petechiae were also present in 6 out of 15 horses with diseases other than E.I.A.—for example, streptococcus and staphylococcus infection.—R.M.

DOLL, E. R., WALLACE, M. E. & RICHARDS, M. G. (1954). **Thermal, hematological, and serological responses of weanling horses following inoculation with equine abortion virus: its similarity to equine influenza.**—*Cornell Vet.* **44,** 181-190. [Authors' summary modified.] **98**

Young horses (6–9 months old) inoculated intravenously or intranasally with the Kentucky-B strain of equine abortion virus developed a febrile disease accompanied by leucopenia and symptoms of mild respiratory infection. The fevers appeared on the second or third day after inoculation, were diphasic in character, and persisted for 8 to 10 days. In general, development of the leucopenia and return of the white cell count to normal levels occurred in parallel with the thermal reaction. Complement-fixing antibody appeared on the 10th day after intravenous inoculation and on the 11th and 12th days after intranasal inoculation. The disease was closely similar to uncomplicated equine influenza. The abortion virus appears to be the inciting agent of epizootic respiratory infection of unweaned and newly weaned horses in central Kentucky.

DOLL, E. R. & KINTNER, J. H. (1954). **A comparative study of the equine abortion and equine influenza viruses.**—*Cornell Vet.* **44,** 355-367. [Authors' summary modified.] **99**

Young horses inoculated with the Army 183 and Grayson I strains of equine influenza virus developed complement-fixing antibody for equine abortion virus anitgens. Direct inoculation of equine foetuses with the two equine influenza viruses resulted in abortion of the foetuses, which presented gross and microscopic lesions identical with those found in abortions resulting from the equine abortion virus. Antigens prepared from the lungs of foetuses that were aborted by each influenza virus fixed complement in the presence of abortion virus immune serum. Likewise, complement was fixed by influenza virus immune serum and abortion virus antigens. These results indicate that the Army 183 and Grayson I strains of equine influenza virus are closely similar to, or identical with, the equine abortion virus.

RANDALL, C. C., STEVENS, W. C. & BRACKEN, E. C. (1954). **Viremia in hamsters inoculated with equine abortion virus.**—*Amer. J. Path.* **30,** 654. [Only abst. given. Abst. modified.] **100**

Goodpasture first demonstrated that unweaned hamsters inoculated with equine abortion virus developed liver lesions with intra-

nuclear inclusions. Randall had demonstrated inclusions in hamster tissue maintained *in vitro*, but efforts to confirm the findings in the intact animal met with failure until Doll (1953), after years of painstaking and careful effort, succeeded in adapting the virus to the hamster, resulting in a severe hepatitis with intranuclear inclusions.

In this study the authors attempted to adapt liver passage virus (Doll) to the brain of hamsters 3 to 4 weeks old. Serial intracerebral passage (10 to date) of hamster brain regularly produced hepatitis and death in 36 to 48 hours with abundant intranuclear inclusions. Brain suspension from a late passage regularly killed young animals at a dilution of 10^{-3}. Numerous haematoxylin- and eosin-stained sections of brain from various passages failed to reveal any inclusions, in contrast to the marked hepatitis in all animals. It appears that the virus reaches the liver by way of the blood stream. Undiluted blood and serum from intracerebrally inoculated hamsters collected at 24 and 44 hours killed all recipients when inoculated intracerebrally in 46 to 48 and 24 to 36 hours respectively, with typical liver lesions. All members of a similarly inoculated group, but receiving immune horse serum intraperitoneally, survived. These experiments demonstrate that viraemia is present in the hamster infected with equine abortion virus: its mechanism is being studied.

WILDE, J. K. H. (1953). **The game animal factor in the control of rinderpest in tropical Africa.**—*Proc. XVth Int. vet. Congr. Stockholm.* 1953. **1,** Pt. 1. 283-287. [In English. French and German summaries.] **101**

A general note emphasizing the importance of wild game as a reservoir of rinderpest. The enormous expense of annual or biennial immunization campaigns, while game remain as an ever-present source of infection, has led to suggestions that the game should be exterminated.

This is a drastic solution, and W. considers that it would be better to preserve game in those areas which are unsuited to stock, while eliminating them rigorously from the stock areas. To evolve a successful plan along these lines would require careful research into the migratory habits of the game, their points of contact with domestic cattle, the distribution of susceptible species, and the disease susceptibilities and immunity levels of the game. If no such solution is found it is certain that the increasing pressure of the human populations on the areas concerned will in any case bring about the gradual extermination of game. This process can be seen in many regions and has already reached an advanced stage in Nigeria.

[The presence of wild game has not proved to be an insuperable obstacle to the eradication of rinderpest from certain areas in Asia, *e.g.* Ceylon, Malaya, Java and the Philippines. Possibly susceptible species of game are more abundant in Africa than in Asia, although in Ceylon wild buffalo, deer of several species and wild boar are very numerous in certain districts. In that country it has been demonstrated that once the disease has been eradicated from the domestic cattle and buffaloes it does not recur in the absence of fresh importation of infection from the mainland of India.]—A.S.

MORNET, P., ORUE, J., LABOUCHE, C. & MAINGUY, P. (1953). Les virus-vaccins contre la peste bovine: le virus bovipestique lapinisé. I. Revue des travaux. II. Recherches effectuées au Laboratoire de Dakar. **[Lapinized rinderpest virus. I. Review of the literature. II. Research performed at the Dakar laboratory.]**—*Rev. Élev.* **6,** 125-166. **102**

The authors reviewed the literature on vaccines against rinderpest, with special reference to lapinized virus. They described the course of infection with rinderpest virus in the rabbit, comparing the body temp. and P.M. findings, and histology with those of normal rabbits, the minimum infective dose of virus for the rabbit, the preparation of freeze-dried lapinized virus, and its use.—R.M.

HERRICK, J. B. (1954). **Field observations on granular vaginitis in cattle.**—*Vet. Med.* **49,** 217. **103**

A note on granular vaginitis and its treatment, describing in particular vaginal insufflation (twice, at a 4-day interval) with 5 g. of a proprietary kaolin-silver picrate compound ("picragol").—CLIVE BRIGGS.

GORET, P., MACKOWIACK, C., LUCAM, F., GIRARD, H. & MARION, P. (1952/53). Recherches sur la vaccination du porc contre la peste porcine à l'aide du virus lapinisé. **[Vaccination of pigs against swine fever with lapinized virus.]**—*Bull. Soc. Sci. vet., Lyon.* **54** & **55,** 463-471. **104**

In experiments with lapinized virus ("Rovac") on 52 pigs the authors found that vaccine alone, in various dosages, gave a febrile reaction between 48 hours and 5 days. No symptoms were observed. Immunity was complete on the 7th day and stood up to challenge. Using the serum-virus technique comparable

results were obtained, but 2 breakdowns suggested a waning immunity over a period of 6 months. It was shown that lapinized virus, Rovac strain and S.F.A. strain (the Armour virulent strain, modified by Hudson by rabbit-passage), was easily maintained by passage and did not lose its immunizing power.

In trials under field conditions on 8,000 pigs with vaccine alone, a solid immunity was obtained; 7·20% had a violent thermal reaction and there were 1·12% fatal accidents. Serum-virus was used in piggeries where infection already existed, with excellent results.

—G. V. Laugier.

Placidi, L. (1953). Sur un diagnostic de "pneumonie à virus" dans une épizootie porcine au Maroc. Ebauche de discussion sur les "variantes" et la parenté des virus. **[Virus pneumonia of pigs in Morocco in an outbreak of disease resembling swine fever.]**—*Maroc méd.* **32,** 1374-1377. **105**

A discussion on whether the serious outbreak of pneumonia in pigs in French Morocco which P. previously described [*V.B.* **23,** 919], was virus pneumonia or was caused by a pneumotropic variant of swine fever virus. He was unable to reach a definite conclusion. [See also *V.B.* **22,** 3709.]—R.M.

Goret, P., Girard, H., Mackowiack, C. M., Joubert, L. & Lucam, F. (1952/53). Sur la pneumonie à virus du porc. Isolement d'un virus pneumotrope à partir d'une souche marocaine de peste porcine. Essais de détection de la maladie en France. **[Virus pneumonia of swine. Isolation of a pneumotropic virus from a Moroccan strain of swine fever virus. Attempts to detect the disease in France.]**—*Bull. Soc. Sci. vet., Lyon.* **54,** & **55,** 457-461. **106**

An account of two experiments on 8 pigs. Pigs immunized with lapinized virus were injected with a Moroccan strain of swine fever virus. Respiratory symptoms were observed in 18–20 days. The authors cited passage experiments to support the contention that this is a virus complex made up of true swine fever virus and a pneumotropic virus of the virus pneumonia type. Attempts to isolate a similar virus in France have so far been unsuccessful.

—G. V. Laugier.

Wesslén, T. & Lannek, N. (1954). **The isolation and cultivation in tissue culture of a cytopathogenic agent from pigs with enzootic pneumonia (so-called virus pneumonia).**—*Nord. VetMed.* **6,** 481-499. [In English. German and Swedish summaries. Authors' summary modified.] **107**

The authors described the isolation of a cytopathogenic agent from 6 out of 8 field cases of enzootic pneumonia in pigs, using the tissue culture technique. The isolations and most of the following work were done on pig lung and kidney tissue. The agent was shown to grow also on bovine and human tissue.

The agent caused enlargement and oedema of the pulmonary lymph nodes when inoculated into pigs. It could be recovered from the affected lymph nodes.

No neutralizing antibodies against the agent were found in serum of experimentally infected pigs or of field cases of enzootic pneumonia.

The agent is highly sensitive *in vitro* to aureomycin and terramycin. It does not agglutinate fowl r.b.c. and does not cause pneumonia in mice.

Manuelidis, E. E., Sprinz, H. & Horstmann, D. M. (1954). **Pathology of Teschen disease (virus encephalomyelitis of swine).**—*Amer. J. Path.* **30,** 567-597. [Authors' summary modified.] **108**

A study of the pathology of Teschen disease revealed that it is a widespread encephalomyelitis confined almost entirely to the gray matter. The lesions consist of degenerative neuronal changes, perivascular infiltrations, and neuronophagic and cell nodules; the latter may be of loose or compact organization, are often found in relation to vessels, and occur in large number at the height of the disease. Microglial cells are the common elements of neuronophagic and cell nodules. The perivascular infiltrations are composed predominantly of lymphocytes.

The authors discussed the relationship of the neuronal damage to the reaction of glial and vascular-mesenchymal tissue. They found that the perivascular infiltrations and the glial reaction can occur not only as a secondary response to neuronal degeneration but also as primary phenomena.

Meningitis is one of the early manifestations of the disease; the inflammation of the meninges is very marked in the cerebellum, moderate in the cerebrum, and slight in the spinal cord.

The morphological manifestations of the disease vary in intensity and quality in different parts of the c.n.s. The authors discussed the distribution of lesions in the early stages and at the height of disease. In the fully developed disease the most severely involved areas are in the cerebellum, cord, thalamus, medulla, midbrain, and pons; less severely affected are the

caudate nucleus, putamen, and pallidum. The cerebral cortical lesions are moderate and are most prominent in the rhinencephalon than in other parts of the cortex.

They studied and critically considered the findings in the peripheral ganglia in Teschen disease.

They described the morphological changes in animals which had recovered from the acute stage of the disease.

They compared Teschen disease with other viral encephalitides. When the comparison is limited to one or a few morphological features, similarities to certain of these encephalitides are found. However, when the entirety of morphological changes, including their quality, quantity, and distribution, is considered, it is not difficult to differentiate this disease from other viral encephalitides and to establish it as a separate disease entity.

Patočka, F., Kubelka, V., Slavík, K. & Boháč, J. (1952). O některých biologických vlastnostech viru encephalomyelitis enzootica suis. (Těšínská choroba.) **[Some biological properties of the virus of porcine encephalomyelitis (Teschen disease).]**—*Ann. Acad. tchécosl. Agric.* **25,** 131-140. [English and Russian summaries.] **109**

The authors studied the biological properties of Teschen disease virus using passaged spinal cord material preserved on dry ice from pigs which had been killed during the paralytic phase. In a number of pigs weighing 10–25 kg. given intracerebrally doses of 0·1–1 ml. of a 10^{-1}–10^{-2} centrifuged cord suspension, the incubation period varied from 6–12 days. The authors failed to set up the disease by intravenous inj. of massive doses of virus. Experimental infection by the intranasal and intraperitoneal routes was stated to be possible but rare.

At the time of appearance of the first symptoms most of the virus was concentrated in the c.n.s., particularly the cord.

During later stages the virus content of the c.n.s. decreased rapidly and after the 5th–7th day of the paralytic stage it could not be demonstrated. Pigs infected by intracerebral inj. did not excrete the virus with their faeces. The size of the virus was established by ultrafiltration as about 25 mμ.

Wild pigs were found to be susceptible to the same extent as domestic ones. Transmission experiments to animals other than pigs failed, although one kitten and two young hamsters developed a form of paralysis following intracerebral inj. of virus. Cultivation attempts in chick embryos failed. A 10% virus suspension became inactivated when kept for 20 min. at 60°C. Ether had no effect on the virus. Alkaline pH appeared to increase its virulence.

A method of purification was described which consisted of exposure of cord material to papain at a pH of 5·5, followed by extraction of fat and acid precipitation. The resulting purified virus retained about 10% of its original virulence.

In respect of its properties Teschen disease virus was stated to resemble the virus of poliomyelitis more closely than those of the arthropod-borne encephalitides.—E.G.

Prier, J. E. & Kalter, S. S. (1954). **Intradermal test for determining resistance to infectious canine hepatitis virus.**—*Proc. Soc. exp. Biol., N.Y.* **86,** 177-179. [Abst. from authors' summary.] **110**

The authors described an i/d test for detecting resistance to canine virus hepatitis. Of 17 animals with negative tests 16 were susceptible to the disease; 14 of 16 positive reactors were resistant to experimental challenge. The test appears to be much more sensitive than the c.f. test.

McGaughey, C. A. (1954). **Infectious myelitis of felines. A note on two cases in young leopards in Ceylon.**—*Ceylon vet. J.* **2,** 18-21. [Abst. from author's summary.] **111**

The author described two unconnected cases of myelitis in young captive leopards in Ceylon. He discussed the similarity of the condition to that of the more chronic form of infectious myelitis of cats, described by Martin & Hintermann [*V.B.* **23,** 1920], and by McGaughey [*V.B.* **24,** 3504], and the possibility of the causal agent being a neurotropic virus similar to those found in various types of encephalomyelitis in rodents.

Belcher, J. (1954). **Distemper in fur bearing animals and new developments in mink enteritis.**—*Canad. J. comp. Med.* **18,** 120-127. **112**

To protect against distemper in mink, breeding stock should be vaccinated before the breeding season and kits after weaning. To counteract an outbreak, clinically affected animals should be destroyed, and the remaining animals vaccinated. The virus of infectious enteritis of mink is the same or similar to that of panleucopenia of cats. The disease may be controlled and treated as in cats.

—P. J. G. Plummer.

JACOTOT, H., VALLÉE, A. & VIRAT, B. (1953). Essais de traitment de la myxomatose des lapins par quelques antibiotiques. **[Trials of antibiotics in the treatment of myxomatosis.]**—*Ann. Inst. Pasteur.* **85,** 801-803. **113**

Individual rabbits infected with myxomatosis were treated with various combinations of antiserum, aureomycin, terramycin, chloramphenicol, dihydrostreptomycin, penicillin, *p*-aminosalicylic acid, *iso*-nicotinic acid hydrazide, sulphadiazine, thiosemicarbazone and nicotinic acid. None of these treatments had any effect. One animal which survived after doses of aureomycin and antiserum was thought to be naturally resistant. The organs of the treated animals were in general bacteria-free.

—J. M. LEACH.

WALKER, R. V. L., MCKERCHER, P. D. & BANNISTER, G. L. (1954). **Studies in Newcastle disease. VII. The possible role of the pigeon as a carrier.**—*Canad. J. comp. Med.* **18,** 244-245. **114**

Pigeons were infected with N.D.V. by the oral and respiratory routes. The disease was less fatal than in chickens. Some died, but others went through the infection presenting few symptoms but excreting virus in sufficient quantity to infect baby chicks.—R. GWATKIN.

MARKHAM, F. S., COX, H. R. & BOTTORFF, C. A. (1954). **Newcastle disease: a serologic study in vaccination and revaccination.**—*Cornell Vet.* **44,** 324-345. [Authors' summary modified.] **115**

The authors presented serological evidence indicating that the response to primary vaccination and to revaccination with Newcastle disease vaccines was limited or suppressed in birds that possessed varying grades of residual immunity. This suppressive effect was most marked when the wing-web and intramuscular routes were employed and least marked when the upper respiratory route was used. Under the same or comparable conditions of age and residual immunity, vaccination by the upper respiratory route with the B-1 strain of virus was found to evoke superior immune responses. The authors discussed the practical implications of these findings and the wide-range utility of the B-1 strain.

GRANOFF, A. & HIRST, G. K. (1954). **Experimental production of combination forms of virus. IV. Mixed influenza A — Newcastle disease virus infections.**—*Proc. Soc. exp. Biol., N.Y.* **86,** 84-88. [Authors' summary slightly modified.] **116**

Mixed infection with the viruses of influenza A and Newcastle disease was found to result in the formation of some particles which had antigenically mixed surfaces, *i.e.,* which contained components from both parent types. The phenotypic change was transitory and did not appear in the progeny of such a particle. The authors suggested that this phenomenon is due to phenotypic mixing.

SIMMONS, G. C., RYLEY, J. W. & MACDONALD, V. M. (1954). **Infectious laryngotracheitis of poultry in Queensland.**—*Aust. vet. J.* **30,** 129-134. **117**

The authors recorded the isolation (by chick embryo inoculation) of the virus of infectious laryngotracheitis, from two outbreaks of respiratory disease in fowls in Queensland. Although it is suggested that the disease may be widely distributed no peracute outbreaks have been seen so far in Queensland. The disease has now been recorded in all States of the Commonwealth except Tasmania and the Northern Territory.—L. HART.

GERLOFF, R. K. & LACKMAN, D. B. (1954). **Observations regarding the presence of psittacosis and related viruses in the northwestern states.**—*Amer. J. publ. Hlth.* **44,** 323-327. [Authors' summary modified.] **118**

The authors presented evidence that antibody to viruses of the psittacosis-lymphogranuloma group is frequently encountered in c.f. tests on human, cattle, and sheep sera collected in the northwestern states of the U.S.A. Lymphogranuloma venereum is practically nonexistent in this area; similarly, the presence of antibody to these viruses is only occasionally explained by a recent illness suggestive of psittacosis. Whether it results from subclinical infections with some member of this group or from constant exposure to a virus present in the environment but not capable of producing illness is not known.

The existence of at least two natural reservoirs in the area for the dissemination of psittacosis-like viruses was demonstrated by the isolation of psittacosis virus from pigeons in western Montana and a related virus from the intestinal tract of calves in the same region.

HINES, M. P. (1954). **Psittacosis (ornithosis).**—*Proc. 26th Ann. Meet. N.E. Conf. Lab. Wkrs Pullorum Dis. Contr.,* Raleigh, N.C., June 14-15, 1954. pp. 7. [Mimeographed.] **119**

H. discussed the present disease position in the U.S.A. and reviewed the various control measures instituted since the disease was first

found there in 1929. Much of the restrictive legislation on the movement of psittacine birds has been removed and to this the present increase in human cases is attributed. H. emphasized the importance to the poultry industry of the recent discovery of the virus in turkey flocks.—D. Luke.

Bedson, S. P. & Gostling, J. V. T. (1954). **A study of the mode of multiplication of psittacosis virus.**—*Brit. J. exp. Path.* **35,** 299-308. [Authors' summary modified.] **120**

The authors studied the mode of multiplication of psittacosis virus in the spleens of mice inoculated intraperitoneally, by microscopy of stained spleen impression preparations and by serological tests for various forms of virus material, in addition to the inoculation of mice for the detection of infective virus. They found no evidence suggesting that this virus multiplies in a non-infective form. The evidence indicated that in the spleens of infected mice psittacosis virus multiplies by binary fission.

Enright, J. B., Thomas, R. C. & Mullett, P. A. (1953). **Q fever and its relation to dairy products.**—*J. Milk Tech.* **16,** 263-266. **121**

A report on survival tests of the viability of *Rickettsia burneti* in different concentrations in sterile skim milk heated at various temperatures for 30 min. The organisms may survive present-day pasteurization processes.

—C. A. E. Briggs.

Giroud, P. & Gaillard, J.-A. (1953). Dévelopement des rickettsies aux depens du cytoplasme des cellules hotes au cours de l'infection due à *Rickettsia burneti, Rickettsia orientalis, Rickettsia mooseri, Rickettsia prowazeki* et *Rickettsia conori.* **[Development of rickettsiae in the cytoplasm of host cells.]**—*Bull. Soc. Path. exot.* **46,** 16-19. **122**

A description of rickettsiae in the cytoplasm of cells of the reticulo-endothelial system of g. pigs infected with *R. burneti.* The authors attributed changes in the staining properties of the cytoplasm to the presence of invisible forms of rickettsiae. They stated that similar observations were made in animals infected with *R. orientalis, R. mooseri, R. prowazeki* and *R. conori.*—R.M.

See also abst. **259** (report, Civil Veterinary Dept., Punjab, India).

IMMUNITY

Enders, J. F. (1954). **Tissue cultures in the study of immunity: retrospection and anticipation.**—*J. Immunol.* **73,** 62-66. **123**

Unless great refinement is required, tissue culture is no longer a delicate art to be practised only by the specialist in an especially equipped laboratory. E. discussed some of the divisions of immunology to which illuminating contributions have been made and which will be extended through the application of tissue culture techniques.—W. R. Bett.

Axelrod, A. E. & Pruzansky, J. (1954). **Role of the vitamins in antibody production.**—*Nutr. Symposium Ser.* No. **8,** pp. 26-37. [Authors' summary slightly modified.] **124**

In previous studies [*V.B.* **23,** 1952] the authors had demonstrated the role of certain of the B vitamins in determining antibody response following the antigenic stimulus of group O, Rh positive human erythocytes. These studies were continued with emphasis upon other facets of the general problem of the relationship of nutritional state to antibody production and disease resistance. It was found that: (1) Rh factors, C and D, play no significant role in the antigenic spectrum of the human erythrocytes utilized for haemagglutinin production in the albino rat; (2) No significant quantities of "blocking" or "incomplete" antibodies following injection of human erythrocytes into the rat were observed; (3) Vitamin deficiency states had no effect upon total lytic serum complement; (4) No correlation existed between the number of circulating lymphocytes and the ability of vitamin-deficient rats to produce antibodies; (5) Electrophoretic analyses failed to show any effects of the vitamin deficiencies upon the serum protein pattern of immunized or non-immunized rats.

Hanan, R. & Oyama, J. (1954). **Inhibition of antibody formation in mature rabbits by contact with the antigen at an early age.**—*J. Immunol.* **73,** 49-53. [Authors' summary slightly modified.] **125**

Rabbits subjected to early immunization with bovine serum albumin failed to develop antibody to bovine serum albumin either during the initial immunization or when mature. Evidence was also obtained that formation of antibody to an unrelated antigen (egg albumen) may be affected.

The γ-globulin content of the sera of these

animals was as high or higher than the γ-globulin content of the sera of control animals in which antibody production was not affected.

SCHMIDT, M. H. & WOLFE, H. R. (1953). **Precipitin production in chickens. IX. A quantitative study of the antibody response to nine different purified substances.**—*J. Immunol.* **71,** 214-219. **126**

Various substances were compared as antigens in fowls. Bovine globulin proved most antigenic, followed by bovine albumin, human globulin, human albumin, pumpkin seed globulin, vicilin (pea protein), haemoglobin and thyroglobin, in that order. Simultaneous injection of vicilin and bovine albumin apparently reduced both antibody responses; there was no such interference between human globulin and haemoglobin.—J. E. SMITH.

BRAMBELL, F. W. R., BRIERLEY, J., HALLIDAY, R. & HEMMINGS, W. A. (1954). **Transference of passive immunity from mother to young.**—*Lancet.* **266,** 964-965. **127**

A general discussion, with reference to the authors' own work. [See also *V.B.* **21,** 1028; **22,** 1378, 2099, 3577 & 3730.]—R.M.

LAPORTE, R., HARDRE DE LOOZE, L. & SILLARD, R. (1953). Immunologie de l'hémolyse. II. Immunisation anti-hémolytique. **[Haemolysis and immunology.]**—*Ann. Inst. Pasteur.* **84,** 532-544. **128**

Daily intravenous injection of rabbits with subtoxic doses of anti-rabbit-erythrocyte horse serum induced the formation of antibodies inhibiting the *in vivo* haemotoxic and the *in vitro* haemolytic and haemagglutinating effect of such sera.—J. E. SMITH.

METAXAS, M. N. & METAXAS-BÜHLER, M. (1954). Frühreaktion und Spätreaktion bei der Serumallergie des Meerschweinchens und ihre Trennung durch passive Übertragung. **[Early reaction and delayed reaction in serum allergy of g. pigs and their separation by passive transmission.]**—*Schweiz. Z. Path.* **17,** 128-146. [English and French summaries. English summary modified.] **129**

G. pigs sensitized with horse serum together with B.C.G. and Freund's adjuvants respond to the protein antigen with an early and a delayed skin reaction. This dual reactivity is also present, though it is considerably weaker, in animals sensitized with horse serum and adjuvants, or with horse serum alone. Both the early and the delayed action can be passively transferred to normal g. pigs, the former by means of strongly precipitating antiserum, the latter by means of cells from the peritoneal exudate of actively sensitized animals.

MCDOWALL, R. J. S. (1953). **The function of the adrenal gland, with special reference to allergy.**—*Acta allerg. Kbh.* Suppl. III. pp. 7-12. [In English.] **130**

A general account.—R.M.

See also absts. **10-11** (experimental streptococcal mastitis in goats); **18** (serum protein studies in experimental TB.); **19** (tuberculin shock); **24** (creation of swine erysipelas carriers by immunization); **27** (study of Past. pseudotuberculosis); **29** (production of antigens by Past. pestis in a synthetic medium); **31** (pullorum disease in turkeys); **32** (a new salmonella type isolated from turkeys); **33** (fowl typhoid); **35** (serological cross reactions between Brucella and Salmonella); **36** (ring test); **38-41** (control of brucellosis); **70** (anaplasmosis complement-fixing antibody); **71** (serological response in rats to Toxoplasma infection); **79-82** (F. & M. disease); **84-88** (rabies); **93** (cross immunity tests with viruses of dog distemper and poliomyelitis); **94** (presence in human sera of bovine encephalomyelitis antibodies); **102** (rinderpest); **104** (swine fever); **115-116** (Newcastle disease).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

LINDQUIST, A. W. & HOFFMAN, R. A. (1954). **Effectiveness of cattle-rubbing devices and hand dusting for horn fly control.**—*J. econ. Ent.* **47,** 79-81. **131**

Sacking soaked in fuel oil, containing 5% D.D.T. or chlordane (a chlorinated naphthalene derivative), and fastened to a length of chain used as a rubbing device for cattle, gave good control of *Siphona* (*Lyperosia*) *irritans,* for 30 to 70 days. However no effect on other blood-sucking flies was observed. A single application of a tablespoonful of a 50% methoxychlor wettable powder dusted on to the backs and sides of cattle was also effective for up to 3 weeks against *S.* (*L.*) *irritans.*—D. W. JOLLY.

RAGEAU, J. & ADAM, J.-P. (1953). Répartition des glossines au Cameroun français (1953). **[Distribution of tsetse flies in the French Cameroons.]**—*Rev. Élev.* **6,** 73-76. **132**

The authors discussed and mapped the geographical distribution of 11 species and 2 varieties of *Glossina* in the French Cameroons.

—D. POYNTER.

LEA, A. O., JR. & DALMAT, H. T. (1954). **Screening studies of chemicals for larval control of blackflies in Guatemala.**—*J. econ. Ent.* **47,** 135-141. **133**

The screening studies were evolved to evaluate chemicals for the control of the larval stages

of the simulid vectors of onchocerciasis. The methods described involved the collection of wild larvae, and their maintenance in the laboratory, under conditions which simulate their natural habitat of running water. The larvicidal effect of about 800 chemicals was assessed of which the organic phosphorus insecticides were the best. Six references were listed.

—D. W. JOLLY.

FURMAN, D. P. (1954). **A revision of the genus *Pneumonyssus* (Acarina: Halarachnidae).** —*J. Parasit.* **40,** 31-42. **134**

F. listed the distinguishing features of the Halarachnidae and gave a modification of earlier descriptions, and a key to 8 species of *Pneumonyssus*. He described the male of *P. caninum* and one new species, *P. bakeri*. One specimen of the latter was found on a rodent and appears to be intermediate between the Halarachnidae and Entonyssidae.—M. L. CLARKE.

BIGLAND, C. H. (1954). **A rabbit infestation with poultry mites and experimental mite transmission of fowl cholera.** — *Canad. J. comp. Med.* **18,** 213-214. **135**

A rabbit which had died as a result of *Pasteurella septica* (*multocida*) infection was found to be infested with *Dermanyssus gallinae*. Inoculation of a ground-up suspension of mites into two healthy rabbits reproduced the infection. Natural mite transmission was not successful; B. suggested possible reasons.

—THOMAS MOORE.

See also absts. **95** (ecology of Western equine encephalomyelitis); **141** (mosquito vectors of filarial worms).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

SOULSBY, E. J. L. (1954). **Skin hypersensitivity in cattle infested with *Fasciola hepatica*.** —*J. comp. Path.* **64,** 267-274. [Authors' summary modified.] **136**

The results of this study confirmed and extended the work of previous authors and established that infestation with *F. hepatica* produces a hypersensitive state in the body. Infestation in cattle can be diagnosed by means of an i/d test with approx. 90% accuracy, the test being relatively specific. Hypersensitivity could be induced passively by transfer of serum. Desensitization of a local skin area was produced, but generalized desensitization could not be effected to such a marked degree.

POYNTER, D. (1954). **Second ecdysis of infective nematode larvae parasitic in the horse.** [Correspondence.] — *Nature, Lond.* **173,** 781. **137**

Ecdysis was successfully induced in third stage infective larvae of *Strongylus vulgaris, S. edentatus, Trichostrongylus axei,* and species of *Triodontophorus, Trichonema,* and *Oesophagodontus robustus* by exposing them to fresh equine duodenal contents which had been filtered through muslin, and diluted with an equal volume of distilled water, the whole being maintained at 38°C.—D. W. JOLLY.

MORNET, P., ORUE, J. & SANE, M. (1953). L'ancylostomose canine à Dakar. **[Canine ancylostomiasis in Dakar.]** — *Rev. Élev.* **6,** 195-211. **138**

Ancylostomiasis is of frequent occurrence in dogs in Dakar, particularly in hot and humid seasons. The authors concluded that tetrachorethylene is more efficient than diethylcarbamazine, piperazine hydrate or phenothiazine.

—D. POYNTER.

RICHARD, R. M., SHUMARD, R. F., POPE, A. L., PHILLIPS, P. H., HERRICK, C. A. & BOHSTEDT, G. (1954). **The effect of certain mineral supplements on lambs infected with the stomach worm (*Haemonchus contortus*).** — *J. Anim. Sci.* **13,** 694-705. [Abst. from authors' summary.] **139**

Experiments to determine the effect of mineral supplementation on lambs infested with *H. contortus* revealed that the greatest resistance to infestation was obtained by feeding cobalt mixed with steamed bone meal. The effectiveness of cobalt supplements may be due, at least in part, to an increased rate of synthesis of vitamin B_{12} in the rumen and its increased availability to the host. The exact mechanism by which steamed bone meal increases resistance to *H. contortus* infestation is not clear; it appears, however, that when lambs are subjected to the severe strain of heavy parasitic infestation, their requirements for factors contained in steamed bone meal are considerably increased.

BROWN, H. W. & STERMAN, M. M. (1954). **Treatment of *Ascaris lumbricoides* infections with piperazine citrate.**—Amer. J. trop. Med. *Hyg.* **3,** 750-754. [Authors' summary modified.] **140**

Clinical trials with piperazine citrate in human patients indicated that it possesses great activity against *A. lumbricoides*.

RAGHAVAN, N. G. S., MISRA, B. G. & ROY, R. (1952). **Filarial infections in mosquitoes.** [Correspondence.] — *Nature, Lond.* **170,** 253. **141**

The authors found that in India *Culex fatigans* acted as a vector for *Wuchereria bancrofti* in man, and that *Mansonioides annulifera* acted as a vector for *Diroflaria repens* in dogs. —BERYL A. KAY.

DOUGLAS, J. R., CORDY, D. R. & SPURLOCK, G. M. (1954). ***Elaeophora schneideri* Wehr and Dikmans 1935 (Nematoda, Filarioidea) in California sheep.**—*Cornell Vet.* **44,** 252-258. **142**

The authors reported skin lesions of the fronto-parietal region in a sheep in California and in 3 others recently brought there from Oregon from which larvae of *E. schneideri* were recovered. A male and a female worm were recovered P.M. from the left ventricle and from the aorta respectively of the one, but not from the other three. The condition had not previously been reported in sheep from these two States, though the worm has been reported from deer in California and other States.—F.E.W.

LEWERT, R. M. & LEE, C.-L. (1954). **Studies on the passage of helminth larvae through host tissues. I. Histochemical studies on the extracellular changes caused by penetrating larvae. II. Enzymatic activity of larvae *in vitro* and *in vivo*.**—*J. infect. Dis.* **95,** 13-51. [Authors' summary modified.] **143**

I. An account of histochemical studies of most tissues being transversed by infective helminth larvae, with particular emphasis on the condition of the extracellular glycoprotein of the dermis. The larvae studied included those of *Schistosoma mansoni, Schistosomatium douthitti, Strongyloides simiae, Str. ratti, Ancylostoma caninum, Nippostrongylus muris* and *Trichinella spiralis*.

Profound alterations of the extracellular glycoprotein-containing material of the skin, notably the basement membrane and ground substance, accompanied penetration by the schistosomes, and by *Strongyloides* and *Ancyclostoma*. Related changes were noted in tissues containing schistosome eggs and in the snail being penetrated by miracidia.

The larval secretions caused a disappearance of the basement membrane at the site of penetration, formation of water-soluble glycoprotein in the dermal ground substance and an increase in free water in the ground substance.

Helminth penetration caused less alteration of acellular substance in aged rats than in young rats and was correspondingly inhibited. It is of interest that in the aged animals, the basement membrane was thicker and was presumably more highly polymerized, as was the ground substance.

In young hypophysectomized animals, there was also a reduction in the degree of glycoprotein alteration with penetration, again correlated with inhibition of penetration. It was considered significant that these animals, like aged rats, have thicker basement membranes and more highly polymerized basement membranes and ground substance.

Penetration of the skin was inhibited to various degrees in immune animals and in cortisone-treated animals.

Intravenous antihistamines had no effect on the rate of penetration nor on the glycoprotein changes observed histochemically.

Skin penetration by *N. muris* was not accompanied by the extensive changes in glycoprotein found with the other skin-penetrating forms studied. Its activity did cause an increase in the free water of the ground substance.

Penetration of tissues by *T. spiralis* was also unaccompanied by immediate changes in host glycoprotein of the type described for other species. However, the authors described progressive changes in the glycoprotein capsule that forms about the larvae in muscle.

II. Enzymatic studies of the larvae listed revealed correlation between the presence of a coagulase-like activity and the ability to cause changes in the glycoprotein of the host. The larvae of *S. mansoni, S. douthitti, S. simiae, S. ratti* and *A. caninum* possess this enzyme or enzyme complex which is capable of releasing dye from azocoll and is also active against a gelatin substrate. Collagenase is not present in larvae of *N. muris, T. spiralis* and *Rhabditis pellio* nor in the plagiorchid and strigeid cercariae tested.

The authors concluded that the mechanism of penetration of those parasites which cause changes in the basement membrane and ground substance of the host skin is related to the production of a collagenase-like enzyme. Alterations of the states of organization of the hosts' glycoprotein are reflected in changes in the ability of the parasites to penetrate.

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

FANKHAUSER, R. & WYLER, R. (1954). Chromophobes Adenom der Hypophyse bei einem Hund. **[Adenoma of the pituitary gland of a dog.]**—*Schweiz. Arch. Tierheilk.* **96,** 181-188. [English, French and Italian summaries.] **144**

The authors described the clin. and pathological features of a case of chromophobe adenoma of the pituitary gland of a 15-year-old fox terrier bitch. The clin. features of endocrine disturbance were attributable to the compression of the ant. pituitary gland and to the damage to the midbrain, and the neurological symptoms (disorientation and circling movements) to the presence of a space-occupying lesion and to an accompanying meningitis.—E. COTCHIN.

KRAMER, W. & BEIJERS, J. D. (1954). Een geval van een intraspinaal meningioom bij een hond. **[Meningioma of the spinal cord in a dog.]**—*Tijdschr. Diergeneesk.* **79,** 253-259. [English, French and German summaries.] **145**

An account of a fibroblastic meningioma in the lumbar region of the spinal cord in a dog. Paralysis and loss of skin sensitivity developed after trauma, which influenced the regional circulation.—C. A. VAN DORSSEN.

CAMERON, G. R. (1954). **The liver as a site and source of cancer.**— *Brit. med. J.* Feb. 13th 347-352. **146**

In man, secondary tumours are often seen more frequently in the liver than in the lung, even when the primary tumour is not situated in the portal area. C. discussed experimental and other observations bearing on the problem of metastasis in general, and metastasis to the liver in particular, under the headings: invasion of blood and lymph vessels by cancer cells; carriage of tumour emboli in the blood and lymph streams; the development of metastases.

In discussing the liver as a site of metastases, he referred in particular to the hypothesis that the organ provides a congenial "soil" in which cancer cells may live and grow. Factors of importance in this "soil" might include oxygen supply, nutrition, cellular and humoral defence mechanisms, and the balance of competition between the normal and the cancer cells for oxygen and food. He urged further investigation of the various problems raised in this discussion.—E. COTCHIN.

PEARCE, J. M. & LASORTE, A. F. (1954). **Effects of an antihyaluronidase substance and of hyaluronidase on growth of virus-induced fibromas.**—*Proc. Soc. exp. Biol., N.Y.* **86,** 573-577. [Abst. from authors' summary.] **147**

The authors described the action of an antihyaluronidase substance that strikingly inhibits the growth of Shope's fibroma, the inhibition being due to its action on the cells or ground substance of the host and not to action on the virus.

CORNATZER, W. E., GALLO, D. G., DAVISON, J. P. & FISCHER, R. G. (1953). **Phospholipoid and protein-bound phosphorus synthesis in the rabbit papilloma.** — *Cancer Res.* **13,** 795-797. [Authors' summary modified.] **148**

In measurements of the synthesis of phospholipoid P and protein-bound P in the Shope papilloma and in the skin of healthy control rabbits with the aid of radio-active phosphorus, the specific activity, relative specific activity, or relative radio-activity values being taken as a measure of their synthesis, there was a significant increase in phospholipoid P and protein-bound P in the papilloma when compared with normal skin. There was less lipoid and more phosphorus in the acid-soluble and protein-bound fraction of the papilloma than in the skin.

See also abst. **260** (book, biochemistry of cancer).

NUTRITIONAL AND METABOLIC DISORDERS

DALE, H. E., STEWART, R. E. & BRODY, S. (1954). **Rumen temperature. I. Temperature gradients during feeding and fasting.**— *Cornell Vet.* **44,** 368-374. [Authors' summary modified.] **149**

The authors described a method for measuring rumen temperature at three levels using thermocouples and a recording potentiometer with an over-all precision of 0·2°C. When feed was always available to the cow, the rumen temp. was 4°F. above the rectal temp., but only 1·5°F. above the rectal temp. if the feed was removed for 24 hours. If 4 lb. of hay was fed to the fasting cow, the mid-point temp. of the rumen increased (within 15 min. after the cow began to eat) from the preceding level of 101°F. to the fed level of almost 104°F. The administration (by stomach tube) of 14 lb.

of water of the same temp. as the environment (62°F.) reduced the rumen temp. from 101–104°F. to 80–95°F. (depending on the rumen regions). The rumen temp. increased rapidly during the first 5 min. after the water input and more slowly thereafter, reaching the rectal temp. (101°F.) within 2 hours after the ingestion of water. The top-to-bottom temp. difference in the rumen was about 4°F. During the fluctuations in rumen temp., the rectal temp. remained constant.

NANGERONI, L. L. (1954). **Variations in intraruminal temperatures of sheep during normal and abnormal conditions.**—*Cornell Vet.* **44,** 403-416. [Abst. from author's summary.] **150**

N. confirmed that the ingestion of food raises the intraruminal temperature. The extent to which the temp. was raised could not be considered to be of such a magnitude as to cause digestive disturbances. The placing of a readily assimilated carbohydrate such as glucose in the rumen did not increase the rumen temp., nor did free oxygen supplied intraruminally under pressure slightly above normal rumen pressure. The latter treatment, even when continued for 24 hours, had no detrimental effect on the sheep.

Overfeeding four sheep by placing 1·8 kg. of coarsely ground wheat or rye in the rumen caused a digestive disturbance; new wheat seemed to have a more drastic effect. One sheep given wheat died within 48 hours from acute gastro-enteritis and associated toxaemia, and another became ill enough to remain recumbent for 3 days. In no case of overfeeding was the temp. elevation beyond the range encountered in normal feeding. It would appear, therefore, that increased temperatures cannot be held responsible for the lesions found within the compartments of the ruminant stomach following overeating.

COTES, P. M. & CROSS, B. A. (1954). **The influence of suckling on food intake and growth of adult female rats.**—*J. Endocrin.* **10,** 363-367. [Authors' summary copied *verbatim.*] **151**

Changes in body weight and food intake were studied for 14 days *post partum* in primiparous rats.

The growth increments in suckled rats with galactophores cut to prevent milk withdrawal and in normally lactating rats were greater than in unsuckled controls. The growth increments in rats with galactophores cut were accompanied by parallel increases in food intake.

Injection of 3 i.u. prolactin daily did not reproduce these changes in body weight and food intake in non-suckled rats.

The results suggest that the main factor in the extra growth of lactating rats is an increased food intake in excess of the metabolic needs for milk secretion induced by the stimulus of suckling.

FLUX, D. S., FOLLEY, S. J. & ROWLAND, S. J. (1954). **The effect of adrenocorticotrophic hormone on the yield and composition of the milk of the cow.**—*J. Endocrin.* **10,** 333-339. [Authors' summary copied *verbatim.*] **152**

A long-acting preparation of ACTH depressed the milk yields of cows when given in single doses of 100 or 200 i.u., or when a 100 i.u. dose was given every second day, and the extent of the decline in milk yield was correlated with the percentage reduction in the number of circulating eosinophils. Milk yields returned to or almost to pre-treatment levels soon after the cessation of treatment.

The composition of the milk was changed only slightly as a result of ACTH administration, the butterfat and protein content being increased, while the lactose content showed a small, but not statistically significant, fall. The quantities of sodium and potassium showed no change which could be attributed to the treatment.

LUQUE, J. M. S. (1953). Problemas actuales de la patología de la nutrición. **[Problems of nutritional diseases.]** — *Arch. Vet. Pract., Corunna.* **3,** No. 31. pp. Pat 1 - Pat 9, 18 pp. **153**

A general account of disease in animals resulting from undernutrition; deficiency of proteins, fats, carbohydrates, minerals or vitamins; unbalanced diets; and presence in the diet of antagonists such as antivitamins.—R.M.

GIROUD, A. (1954). Malformations embryonnaires d'origine carentielle. **[Embryonic malformations caused by dietary deficiencies.]**—*Biol. Rev.* **29,** 220-250. [In French. English summary.] **154**

A comprehensive review with an extensive bibliography. Maternal nutritional deficiencies may retard embryonic development or provoke lesions and malformations. They act by metabolic disturbance and at an early stage may affect organizers. Genetical factors may modify the outcome. These phenomena observed in birds and mammals are also probably found in domestic animals and man. Maternal nutrition should therefore be closely supervised.

—D. POYNTER.

Stański, F. & Staśkiewicz, G. (1953). Leczenie zaburzén czynnościowych przedżołądków za pomocą przenoszenia treści żwacza. [**Use of ruminal contents for the treatment of digestive disorders in ruminants.**] — *Méd. vét., Varsovie.* **9**, 543-546. [In Polish.] **155**

The authors discussed the composition and function of the ruminal content. They emphasized the importance of the use of ruminal content as a stimulant of ruminal activity in sick animals.

In young calves where the stomachs are in process of development and constant danger of fatal scouring exists, injection of ruminal content from healthy cattle eliminates that danger. The Soviet system of rearing calves is based on that principle.

The authors recommended the use of ruminal content in acetonaemia, atony of the rumen, mastitis, convalescence *post partum*, etc.—J. R. Mitchell.

Priouzeau, M. (1954). Intoxications alimentaires à retentissement pulmonaire, chez les bovidés. [**Alimentary intoxications which involve the lungs, in cattle.**]—*Rec. Méd. vét.* **130**, 81-104. **156**

A discursive account of the symptoms which may follow the ingestion of cultivated Cruciferae, cress, peppermint and thyme, and of the appropriate treatment. P. also discussed the aetiology of 'maladie des regains' ("fog fever"), which affects stock on autumn pasturage.

—A. Seaman.

I. Filmer, J. F. (1954). **Preventing outbreaks of facial eczema.**—*N.Z. J. Agric.* **88**, 31. **157**

II. Perrin, D. D., White, E. P. & Clare, N. T. (1953). **Some recent advances in facial eczema research.**—*Proc. 13th. Ann. Conf. N.Z. Soc. anim. Prod.* **13**, pp. 121-125. Discussion: p. 126. **158**

I. F. recommended restriction of grazing by sheep and cattle susceptible to facial eczema, during periods of hot wet weather in February, March and April. Toxic fodder consists of perennial rye grass-white clover mixture.

II. Laboratory investigations are being carried out, on the levels of serum proteins and amino acids in circulation in animals affected with facial eczema. Sheep and g. pigs which were fed the product of toxic grasses extracted by organic solvents, developed liver lesions, which were found to be the primary somatic cause of the eczematous condition.

—J. Mackenzie.

Arnold, R. M. (1954). **Manchester wasting disease. A disease of ruminants manifested by metastatic calcification especially of the cardio-vascular system.**—*West Ind. med. J.* **3**, 1-8. **159**

A chronic progressive lesion occurs, particularly in cattle and occasionally in goats, grazing the limestone pastures of the Manchester Uplands in the centre of Jamaica where the soil is known to be deficient in phosphate, potassium and nitrogen; overstocking is prevalent and droughts accentuate malnutrition. "Crab grass" (*Stenotaphrum secundatum*) is dominant: its crude protein content is 6·5% and its phosphate content is also low.

It is estimated that at least 10% of animals are affected to some extent. The symptoms include stiffness especially in the forelegs, listlessness, inappetence or depraved appetite, emaciation after 3 months, decline and cessation of milk yield. Heart symptoms with varying degrees of murmur then become apparent.

The gross lesions include a hide-bound appearance of the carcass with extreme emaciation; bed sores are present on the shoulders, quarters and knees; there is absence of subcutaneous fat and the muscles are pale and fibrotic. Small calcified areas are found on the parietal pleura, especially that of the diaphragm. Parts of the lungs fail to collapse when the thorax is opened and the affected lung feels rough like a "loofah" sponge. Areas of calcification are bordered by areas of putty-like consistency. The fat in the coronary grooves is entirely replaced by yellow gelatinous material. There appears to be an increase in lime salts and a decrease in total phosphate in the bones.

The primary histological change is deposition of calcium salts on the elastic and collagenous fibres, particularly in the arteries and arterioles of the cardiovascular system. The jugular vein and the posterior vena cava are the only veins affected.

The author discussed the possible aetiology; he suggested that excessive intake of vitamin D due to solar radiation may play a role. Toxic sterols may be present in "crab grass" which would accentuate the effect. Preliminary attempts to reproduce the disease gave inconclusive results.—F.E.W.

Parkinson, B. & Sutherland, A. K. (1954). **Post-parturient haemoglobinuria of dairy cows.**—*Aust. vet. J.* **30**, 232-236. [Authors' summary modified.] **160**

The authors described 14 cases of post-parturient haemoglobinuria in 7 dairy herds. Two cows died; in the others the acute course was about 5 days and recovery was complete

in 8–10 weeks. Laboratory tests revealed no evidence of leptospirosis or babesiasis.

The condition occurred on country where cattle are known to be affected with phosphate deficiency. The authors suggested that phosphate deficiency is a necessary predisposing factor, and that haemoglobinuria is precipitated by the ingestion of cruciferous plants such as beets or turnips or by other factors not yet identified.

SQUIBB, R. L., GUZMÁN, M., AGUIRRE, F. & SCRIMSHAW, N. S. (1953). **Ten constituents of the blood stream of well-fed white rats, chickens, swine, sheep and horses in Guatemala.**—*Amer. J. vet. Res.* **14,** 484-486. **161**

Economic conditions and poor husbandry lead to low animal production in Guatemala. The authors determined the blood constituents of animals in the country and gave values for total proteins, riboflavin, ascorbic acid, carotenoids, tocopherols, alkaline phosphatase, vitamin A, haemoglobin, haematocrit and red cell count of the species listed in the title, with approximate dietary.—JOHN SEAMER.

WILHELMJ, C. M., MEYERS, V. W., MILANI, D. P. & MCCARTHY, H. H. (1954). **Effect of sodium chloride upon the blood pressure of normal dogs when administered during dietary stress.**—*Amer. J. Physiol.* **176,** 86-88. **162**

The authors presented blood-pressure figures for dogs in a state of dietary "stress" and made an attempt to interpret them in terms of the "adaptation theory".—P. H. HERBERT.

I. WELLER, R. A. & GRAY, F. V. (1954). **The passage of starch through the stomach of the sheep.**—*J. exp. Biol.* **31,** 40-48. **163**

II. GRAY, F. V., PILGRIM, A. F. & WELLER, R. A. (1954). **Functions of the omasum in the stomach of the sheep.** — *Ibid.* 49-55. [Authors' summaries copied *verbatim*.] **164**

I. The greater part of the starch in the stomach of the sheep is present in the fluid portion of the contents, and a large proportion of it may be carried in the ciliate Protozoa of the rumen.

Starch/lignin ratios in the stomach contents suggest that there may be an extensive destruction of starch in the omasum, and this is strongly supported by the lowered concentrations of both starch and Protozoa in the omasal liquid.

A maximum of only 7·8 g. of starch was calculated to pass through the abomasum daily when the ration contained 148 g. starch. When 20–40 g. of starch were fed the quantity passing through was about one-tenth of the quantity ingested, and when the ration contained only 2·9 g. starch, 1·1 g. reached the abomasum.

II. Starch/lignin ratios and nitrogen/lignin ratios in the various compartments of the stomachs of slaughtered sheep indicate that only very small amounts of reticular contents may pass directly to the abomasum via the omasal groove, and that little if any liquid is squeezed away mechanically from the solids in the omasum.

The amount of water calculated to be absorbed from digesta entering the omasum ranged from 33 to 64% and the amount of fatty acid from 40 to 69% in seven sheep slaughtered for these estimations.

ANNISON, E. F. (1954). **Some observations on volatile fatty acids in the sheep's rumen.**—*Biochem. J.* **57,** 400-405. [Author's summary modified.] **165**

The author demonstrated the presence of *iso*butyric, *iso*valeric and 2-methylbutyric acids in the rumen of sheep maintained on various diets.

Polarimetric observation of a partially purified sample of 2-methylbutyric acid isolated from the rumen contents of a sheep fed a casein-rich diet revealed that only the dextrorotatory form was present.

Volatile fatty acids (VFA) higher than C_5 were not observed in the sheep's rumen under normal conditions, although traces of C_6 acid were found in the rumen of fasted sheep. Traces of formic acid were occasionally observed.

The changes in the VFA content of the rumen of sheep when fasted were examined. Although the total VFA level fell steadily, there was only a slight decrease in the concentration of the branched-chain VFA.

CORDIEZ, E. (1951). Les besoins en lysine du porc en croissance. **[The lysine requirement of the growing pig.]**—*Ann. Méd. vét.* **95,** 429-447. **166**

An account of a detailed study, with a good bibliography. A basic diet containing 0·02% lysine is deficient, but the addition of 2% *dl*-lysine hydrochloride, *i.e.*, 0·8% *d*-lysine, ensures a good rate of growth.—D. POYNTER.

ULVESLI, O. & SLAGSVOLD, P. (1952). Prøver med langvarig fosfattilskudd til melkekyr. **[Trials on long-term phosphorus supplements**

in dairy cows.]—*Meld. Norg. LandbrHøisk.* 1952. pp. 1-50. [English summary.] **167**

The cows in 3 herds were divided into control and experimental groups, the latter being fed a daily suppl. of 50 g. dicalcium phosphate and 100 g. disodium phosphate per head. Milk yield and fodder consumption was examined every 7–10 days. The experiment lasted 2 years for 2 herds and 3 years for the third. In one herd the mineral suppl. was also given during summer pasturing.

No conclusive effect on milk yield or fertility was observed, although there was an inconclusive improvement in fertility on the smallest farm. The authors gave data for calving intervals, inseminations and treatment per conception. There are 50 figures.

—R. B. Holcombe.

Taylor, T. G., Moore, J. H. & Tomlin, D. H. (1954). **Exchange of bone calcium and phosphorus *in vivo*.** [Correspondence.]—*Nature, Lond.* **173,** 1137-1138. **168**

By continuous feeding of calcium-45 and phosphorus-32 to laying pullets on normal and low calcium diets, the authors obtained figures for percentage exchange which confirmed the opinion that the incorporation by exchange is insufficient to invalidate the use of tracer techniques in studies of bone growth.

—P. H. Herbert.

Hopkirk, C. M. S. & Patterson, J. B. E. (1954). **The story of cobalt deficiency in animal health.** pp. 26. London: The Mond Nickel Company Limited. **169**

This 20-page booklet reviews the relevant literature dating from 1794 to 1952 and contains an author reference index of 101 articles on cobalt and allied mineral deficiencies. Two paragraphs on experimental work with the salts of iron and cobalt are included. The application of cobalt therapy, subclinical effects of cobalt deficiency and dosage, are also discussed.

—J. Mackenzie.

Gray, L. F. & Daniel, L. J. (1954). **Some effects of excess molybdenum on the nutrition of the rat.** — *J. Nutr.* **53,** 43-51. [Authors' summary slightly modified.] **170**

The addition of methionine to the diet markedly prevented the harmful effects of excess molybdenum.

The relationship between copper and molybdenum was again demonstrated, as supplementary copper prevented approximately one-third of the deleterious effect of molybdenum at the levels used in these studies. Supplementation of the diet with both methionine and copper was no more efficacious in counteracting the toxicity than the use of methionine only.

Vitamin B_{12} alleviated molybdenum toxicity in one experiment reported. This effect could not be repeated. The authors suggested reasons for the differences in results obtained.

They presented possible explanations for the efficiency of methionine in counteracting the toxic effects of dietary molybdenum.

Dick, A. T. (1954). **Preliminary observations on the effect of high intakes of molybdenum and of inorganic sulphate on blood copper and on fleece character in crossbred sheep.**—*Aust. vet. J.* **30,** 196-202. [Author's summary modified.] **171**

When the molybdenum intake of crossbred sheep is raised to high levels, the conc. of copper in the blood is increased if the diet also contains inorganic sulphate.

The amount by which the level of copper in the blood rises is dependent upon the level of the molybdenum intake, within the range 15–90 mg. per day, when the sulphate intake is constant, and is dependent upon the sulphate intake when the molybdenum intake is constant within this range.

On the evidence of the development of a "steely-wool" lesion associated with this rise in blood copper, D. suggested that, under these conditions, a large proportion of the circulating copper is not available to the enzyme systems concerned with development of fleece character, and that the higher intakes of molybdenum and sulphate produce a "physiological" copper deficiency in the sheep.

Inglis, J. S. S., Weipers, M. & Marr, A. (1954). **Some observations on bovine hypomagnesaemia.**—*Vet. Rec.* **66,** 353-354. **172**

The authors gave clinical and biochemical data for a severe outbreak of hypomagnesaemia (14 out of 22 cows died). The deficiency was associated with a delayed feeding of hay supplements in exceptionally mild weather, in contradistinction to other reports where cold wet weather had been implicated. Feeding hay reversed the trend.—P. H. Herbert.

Mittler, S. & Benham, G. H. (1954). **Nutritional availability of iodine from several insoluble iodine compounds.**—*J. Nutr.* **53,** 53-58. [Authors' summary copied *verbatim*.] **173**

Iodine was found to be nutritionally available from insoluble cuprous iodide, diiododithymol, and 3-5-diiodosalicyclic acid. Acute

chronic toxicity tests indicated that Cu_2I_2 and 3-5-diiodosalicyclic acid were non-toxic in amounts required to protect the thyroid gland.

VAN KOETSVELD, E. E. (1954). De invloed van de voeding op het haarkleed en de samenstelling van het haar. [**Influence of nutrition on the coat and on the chemical composition of the hair.**]—*Tijdschr. Diergeneesk.* **79,** 405-416. [English, French and German summaries.] **174**

The normal manganese content of pigmented hair in cattle is 7 to 20 p.p.m., the Mn content of unpigmented hair being lower. In cases of deficiency the author found a content of 2–5 p.p.m. and in some cases of nymphomania 25 to 40 p.p.m.—C. A. VAN DORSSEN.

HILL, R. M. & HOLTKAMP, D. E. (1954). **Storage of dietary manganese and thiamine in the rat.**—*J. Nutr.* **53,** 73-82. [Authors' summary slightly modified.] **175**

The livers of 95 rats on different levels of dietary thiamine and manganese were assayed for thiamine and manganese. The small intestines of 69, and the caeca and colons of 8 pairs of these rats were assayed for manganese.

Storage of thiamine in the liver increases with supplementation of manganese and thiamine intakes until dietary levels of 10 mg. and 2·0 mg. respectively, per rat per day, are reached. Maximum thiamine storage in the liver, 11–16 μg. per g. wet weight, is higher than has been reported earlier. There is some evidence that storage of thiamine in the liver occurs more readily in young adult rats (13 weeks) than in older rats (36 weeks). With thiamine intake constant at 0·03 mg./rat/day, manganese supplementation of the diet from a level of 0·03 to 1·0 mg./rat/day increases the storage of thiamine in the liver.

Liver storage of manganese increases with increase in dietary intake up to 40 mg. of dietary Mn per day. With Mn intake constant at 1 mg./rat/day, thiamine supplementation of the diet from a level of 0·03 to 0·2 mg./rat/day increases (though not to a significant extent) the mean storage of Mn in the liver. At low levels of dietary Mn, storage of Mn in the wall of the small intestine is from one-third to two-thirds as much per g. of tissue as in the liver. At dietary intakes above 10 mg./day storage per g. in the small intestine is somewhat greater than in the liver.

Storage of Mn in the wall of the caecum and large intestine is as great or greater per g. than it is in the liver.

LANGHAM, R. F. & HUFFMAN, C. F. (1954). **A clinical and pathological study of vitamin A deficiency in calves.**—*Mich. St. Coll. Vet.* **14,** 122-129. [Authors' summary modified.] **176**

Six calves were placed on a basal ration deficient in vitamin A. Two controls received 250,000 I.U. of vitamin A weekly. The calves during the first six months of life did not consume enough nutrients to bring the total digestible nutrients (TDN) up to the recommendations of the National Research Council. During the last six months, the TDN consumed equalled or exceeded the requirements.

The addition of cobalt increased the appetites of these animals after about the third day and their wt. gain per day increased two to three fold.

The most important manifestations of vitamin A deficiency involved the eyes and were characterized by dilation of the pupils, blurring of the optic discs, fading of the tapeta lucida, night blindness, bulging of the eye-balls, nystagmus, total blindness, and decreased diam. of the blood vessels.

The deficient animals had periods of unconsciousness (syncope) which lasted from 30 to 60 secs. Spermatogenesis was not present in the deficient male animals. Metaplasia of the epithelium was observed only in a few organs such as the cervix, ducts of mandibular salivary glands, and the bronchi.

The following manifestations which have been reported in the literature were absent in these calves: rough hair coats and skin lesions, lachrymation, scours, anorexia, oedema, weakness, urinary calculi, and opacity and ulceration of the cornea. Their absence was probably due to the presence of oat hay in the diet.

The authors pointed out the role of hay in maintaining a normal rumen fermentation.

FELL, H. B., MELLANBY, E. & PELC, S. R. (1954). **Influence of excess vitamin A on the sulphate metabolism of chick ectoderm grown *in vitro*.**—*Brit. med. J.* Sept. 11th, 611. [Authors' summary slightly modified.] **177**

The authors found that the sulphur metabolism of the presumptive epidermis of the chick converted into mucus-secreting epithelium *in vitro* by the presence of excess vitamin A in the culture medium is profoundly modified. In the controls, little sulphate is taken up by the squamous epithelium, which thus behaves like normal epidermis *in vivo*, whereas in the explants containing excess vitamin A the utilization of sulphate is comparable to that of a normal mucous membrane in the body.

GRANT, A. B. (1953). **Carotene: a rachitogenic factor in green-feeds.** [Correspondence.]—*Nature, Lond.* **172,** 627. **178**

G. had previously [*V.B.* **22,** 2578] presented data indicating the presence of a rachitogenic factor in green-feeds. By fractionation by paper chromatography of a petroleum ether extract of dried green oats he isolated and identified this factor as carotene. He found it to be rachitogenic for rats. Its presence in winter green-feed may explain the rachitogenic effect of this diet on sheep.—D. POYNTER.

CORDY, D. R. (1954). **Experimental production of steatitis (yellow fat disease) in kittens fed a commercial canned cat food and prevention of the condition by vitamin E.**—*Cornell Vet.* **44,** 310-318. [Author's summary copied *verbatim.*] **179**

Steatitis (yellow fat disease) was reproduced in kittens by feeding them a diet high in fish content. Alpha-tocopherol protected animals against the development of the condition. The lesions were comparable to those seen in the field or produced experimentally by similar diets in various species.

SCOTT, M. L. & HEUSER, G. F. (1954). **Studies on leg weakness in turkeys, ducks and geese.**—*Papers presented to Xth World's Poult. Congr.* Edinburgh, 1954. pp. 255-258. [English and French summaries: p. 51 of Summaries of Section Papers.] **180**

The authors considered the niacin requirements of turkeys, goslings and ducklings to be 32·5, 30 and 25 mg. per lb. of food. Birds receiving inadequate amounts of niacin developed enlarged hocks and bowed legs. Under certain circumstances, a dietary deficiency of vitamin E gave rise to similar changes in turkeys.—E. A. GIBSON.

GOTTLIEB, H. & LALICH, J. J. (1954). **The occurrence of arteriosclerosis in the aorta of swine.** — *Amer. J. Path.* **30,** 851 - 855. [Authors' summary copied *verbatim.*] **181**

Fresh aortas were examined from more than 2,000 swine which varied in age from 4 months to more than 3 years. The incidence of arteriosclerotic plaques was found to increase with age. Firm white or pale yellow intimal plaques of 1 to 10 mm. in size were encountered principally in the descending arch and the thoracic aorta. Such plaques accounted for almost all of the lesions observed, and they were composed of fibrous connective tissue. Sclerosis of the abdominal aorta is more rare. In two of three instances when such lesions were encountered, calcium precipitate was observed in the media.

HARKNESS, M. L. R., HARKNESS, R. D. & SANTLER, J. E. (1954). **Changes in the collagen content of the thyroid in rats treated with thiouracil.**— *J. Physiol* **125,** 51-55. [Authors' summary slightly modified.] **182**

The authors studied the effect of oral administration of thiouracil for various times up to 50 days on the collagen content (estimated chemically) of the rat's thyroid gland. During treatment with thiouracil both the weight and collagen content of the thyroid gland increased, the former more than the latter. After cessation of treatment with thiouracil collagen was reabsorbed, both the wt. and collagen content of the gland decreasing.

TALSMA, D., (1953). **Investigations into the results of some therapies against acetonaemia post partum.**—*Proc. XVth Int. vet. Congr, Stockholm,* 1953. Part I. Vol. 1. pp. 536-540. Discussion: Part II. pp. 274-278. [In English. French and German summaries.] **183**

Supplementing his paper [*V.B.* **24,** 1213], T. emphasized that when ketosis occurs in cattle on silage diet it is a silage with a high butyric acid content. There was a general discussion on the treatment of ketosis.—R.M.

See also absts. **69** (vitamin A deficiency, a predisposing factor in fowl coccidiosis); **124** (role of vitamins in antibody production); **261** (book, work of Sir Robert McCarrison on nutrition problems of India).

DISEASES, GENERAL

MOLTZEN-NIELSEN, H. (1951). Om kodesenebensfrakturer hos hest. **[Fracture of the sesamoid bones in horses.]**—*VI. Nord. Veterinärmötet.* [Proceedings of the VIth Nordic Veterinary Conference, Stockholm, August 10-11th 1951.] pp. 84-96. [In Danish. English summary.] Discussion pp. 96-97. **184**

An account of fracture of sesamoid bones as seen in 10 cases.—R. B. HOLCOMBE.

FOX, F. H. (1954). **Accidental electrocution of dairy cattle.**—*Cornell Vet.* **44,** 103-110. **185**

F. described accidental electrocution of 3 cows from the milking machine motor *via* the vacuum pipe-line and stanchions. He made recommendations concerning proper earthing of electrical equipment.—C. A. E. BRIGGS.

MOULE, G. R. (1954). **Observations on mortality amongst lambs in Queensland.**—

Aust. vet. J. **30,** 153-171. [Author's summary slightly modified.] **186**

An account of the results of 11 observations on factors influencing the survival of 2,467 Merino lambs during the first few weeks of life. Nine of these observations were made in semi-arid tropical Queensland during the years 1949-51.

For the 7 observations, where such a comparison could be made, it was found that 36% of the lambs born died between birth and "marking". [The age at which lambs were "marked" varied from a few days to 3 months.] Fifty-seven per cent. of these losses, representing 21% of the lambs born, occurred at birth or during the first three days of life (for the 11 observations 18% of the lambs born died during this 3-day period).

Intrinsic factors influencing the survival of lambs included the condition of the ewe's udder and her mothering instinct, the birth weight of the lamb, whether single or twin and sex.

Extrinsic factors having a direct effect on the survival of lambs included atmospheric temperature, rainfall, the occurrence of strong winds, infections and the presence of predators. It seems probable that high atmospheric temperatures during the gestation period depressed the birth wt. of lambs. An association was also found between the birth wt. of lambs and the condition of the ewe's udder; ewes with abnormal udders having significantly lighter lambs amongst which a higher infantile mortality was recorded.

GREGORY, D. W. (1954). **Edema disease in swine.**—*Vet Med.* **49,** 185-187. **187**

A note in general terms on an outbreak of oedema disease of pigs.—M. SACHS.

ANON. (1954). **New pig disease in Britain.**—*Vet. Rec.* **66,** 316. **188**

This article gave the text of the announcement in which the Ministry of Agriculture and Fisheries stated that the existence of atrophic rhinitis had been confirmed for the first time amongst pigs in Great Britain. It added that there was little doubt that the infection had been introduced by an apparently healthy Landrace pig imported into England from Sweden. The announcement gave a brief description of the disease and stated that it would be declared a scheduled disease under the Diseases of Animals Act.

Some further details of the symptoms and epidemiology of the disease were given.

—E. A. GIBSON.

BOS, A. W. A. (1954). Acute pancreasnecrose S. pancreatitis haemorrhagica acuta bij een varken. [**Acute necrosis of the pancreas in a pig.**] — *Tijdschr. Diergeneesk.* **79,** 246-253. [English, French and German summaries.] **189**

Acute necrosis of the pancreas was found P.M. in a pig slaughtered in emergency (body temp. 41·1°C.). B. compared the condition with acute haemorrhagic pancreatitis ("Balser's disease") in man.—C. A. VAN DORSSEN.

DE WAEL, J. & TEUNISSEN, G. H. B. (1954). Onderzoek van bloedserum van normale en zieke honden met behulp van papierelectrophorese. [**Examination of blood serum from healthy and from diseased dogs by paper electrophoresis.**]—*Tijdschr. Diergeneesk.* **79,** 447-454. [English, French and German summaries.] **190**

The relative quantities of protein in serum samples from dogs were measured by paper electrophoresis. Significant differences were established in the ratio of the proteins (albumin, α-, β-, and γ-globulins) in cases of hepatitis, cirrhosis of the liver, tumours and inflammations. The method can be used as a differential diagnostic aid.—C. A. VAN DORSSEN.

INNES, J. R. M. & YEVICH, P. P. (1954). **So-called nutritional muscular dystrophy as a cause of "paralysis" in rabbits.**—*Amer. J. Path.* **30,** 555-565. [Authors' summary slightly modified.] **191**

The authors described an intercurrent disease of skeletal muscle in rabbits. The lesions are characterized by degenerative and necrotizing changes, which are the counterparts of those in so-called experimental nutritional muscular dystrophy. The process seemed to have some predilection for the paravertebral group of muscles. The name muscular dystrophy may be somewhat misleading, for the process is essentially that of degeneration, necrosis, and inflammation. The disease may cause wasting of the loins and thus locomotor difficulty, or it may be clinically inapparent with only microscopic lesions. The condition might therefore be a source of error in interpretation of clinically labelled paralysis in rabbits following an experimental procedure.

IRVINE, S. R. & IRVINE, M. D. (1951). **The effect of cortisone on the primary and secondary aqueous and on corneal vascularization in rabbits.**—*Johns Hopk. Hosp. Bull.* **89,** 288-302. [Authors' summary slightly modified.] **192**

Cortisone does not cause diminution of the

protein in the primary aqueous. It appears to have no effect on the level of protein in the secondary aqueous. The effect of cortisone on the increase of protein in the aqueous resulting from "standard" corneal lesions is inconclusive. Corneal vascularization resulting from minor injury by heat, diathermy or galvanic cautery, is definitely inhibited by cortisone.

BOAS, N. F. & SCOW, R. O. (1954). **Apparent exophthalmos in the rat following cortisone treatment or thyroidectomy.**—*Endocrinology.* **55,** 148-155. [Authors' summary modified.] **193**

Young rats dwarfed as the result of cortisone treatment or thyroidectomy developed an apparent exophthalmos. This was shown to be due to normal eyeball growth in conjunction with marked inhibition of head and body growth, and to be unrelated to any increase in mass of the retrobular tissues.

See also abstr. **63** (role of trichomonads in atrophic rhinitis); **263** (book, farm animals in health and disease); **264** (book, diseases of livestock).

POISONS AND POISONING

EYER, J. R., FAULKNER, L. R. & MCCARTY, R. T. (1953). **The effect of toxaphene and DDT on geese in cotton fields.**—*Press Bull. N. Mex. agric. Exp. Sta.* No. 1078. pp. 6. [Mimeographed.] **194**

From tests with young healthy adult geese, the authors concluded that neither toxaphene nor D.D.T. when used as a dust at concentrations ordinarily recommended for the control of the cotton pests, Lygus bugs, stink bugs and bollworms, are likely to poison adult geese grazing in cotton fields. The same is true for D.D.T. when used as a spray. Geese should, however, be removed from fields during spraying with toxaphene; they can safely resume grazing after 24 hours. The authors suggested that goslings and older geese in poor condition may be more susceptible.—F.E.W.

LINK, R. P. & REBER, E. F. (1954). **Observations on bovine hyperkeratosis.**—*N. Amer. Vet.* **35,** 274-276. [Authors' summary modified.] **195**

Typical symptoms and lesions of bovine hyperkeratosis were produced in calves by feeding certain lots of commercial protein concentrate from farms where the disease occurred and where the evidence did not exclude the concentrate as the carrier of the causative factor.

Identification of the hyperkeratogenic substance extracted from one of the lots of protein concentrate was attempted by a comparison of the ultra-violet and infra-red absorption spectrum of this material with those known compounds. The hyperkeratogenic substance had absorption characteristics similar to those of pentochlorenaphthalene.

WELCH, H. & MORRIS, H. E. (1952). **Range plants poisonous to livestock in Montana.**—*Circ. Mont. agric. Exp. Sta.* No. 197. pp. 35. **196**

Poisonous plants are seldom ingested in quantity except in the absence of more palatable forage. Species which caused most losses in Montana were death camas (*Zygadenus* species) in sheep, tall larkspur (*Delphinium* species) in cattle, lupin (*Lupinus* species) in sheep and loco weed (*Astragalus* species) in cattle, horses and sheep.—R. MARSHALL.

COLLET, P. & HENRY, E. (1952/53). Photosensibilisation du dindon par le sarrazin. **[Photosensitization in turkeys due to the ingestion of buckwheat.]**—*Bull. Soc. Sci. vet., Lyon.* **54** & **55,** 437-442. **197**

A flock of turkeys developed symptoms of incoordination, intense pruritus and vesication of the bare parts of the head within a few hours of gaining access to a field of unripe buckwheat. The symptoms persisted for 36 hours, but regressed quickly after treatment with promethazine hydrochloride ("phenergan").

—E. A. GIBSON.

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

EAGLE, H. (1954). **The binding of penicillin in relation to its cytotoxic action. I. Correlation between the penicillin sensitivity and combining activity of intact bacteria and cell-free extracts.** — *J. exp. Med.* **99,** 207-226. **198**

Bacteria in contact with penicillin labelled with C^{14} or S^{35} bound and concentrated the antibiotic, the amount bound from low concentrations (0·001–0·01 μg./ml.) being closely related to the penicillin sensitivity of the strain. Concentration by sensitive strains was as much

as 200-fold. Washing removed only a small proportion of the penicillin. Inactivation by penicillinase or strong acids prevented concentration of the penicillin residues. At equi-effective levels ($LD_{99.9}$) four strains of *Micrococcus pyogenes* bound comparable amounts of penicillin despite wide differences in sensitivity.

Bacteria in the log growth and 'resting' phases and cell-free sonic extracts had similar reactivities with penicillin. At high concentrations (1–1000 μg./ml.) there was non-specific binding by all cell strains and at these high levels penicilloic acid was bound to the same degree as the active antibiotic.—J. M. Leach.

Smith, H. Williams. (1954). **Serum levels of penicillin, dihydrostreptomycin, chloramphenicol, aureomycin and terramycin in chickens.** — *J. comp. Path.* **64**, 225-233. [Author's summary slightly modified.] **199**

The author studied the persistence and levels of penicillin, procaine penicillin, dihydrostreptomycin, chloramphenicol, aureomycin and terramycin in the serum of fowls after oral, intramuscular and intravenous administration.

The results for penicillin, procaine penicillin and dihydrostreptomycin given by intramuscular injection resembled those found in man and other animals. No streptomycin and only a small amount of penicillin was absorbed after oral administration.

Aureomycin and terramycin were absorbed very poorly after oral administration but usually persisted for 24 hours. Low serum levels of aureomycin were also found after intramuscular injection; much higher levels were noted with terramycin.

Chloramphenicol was absorbed very much better from the alimentary tract than were the other agents. It persisted in the serum, however, only for a relatively short period after oral or intramuscular administration.

After oral administration all or nearly all of the dihydrostreptomycin, penicillin, aureomycin and terramycin but none of the chloramphenicol was excreted in the faeces.

More terramycin, but less chloramphenicol, was absorbed from a full than from an empty alimentary tract.

Nelson, M. G., Talbot, J. M. & Binns, T. B. (1954). **Benethamine penicillin: a new salt with a prolonged action.**—*Brit. med. J.* Aug. 7th, 339-341. [Abst. from authors' summary.] **200**

Benethamine penicillin (the *N*-benzyl-β-phenylethylamine salt of penicillin) is relatively insoluble. After a single therapeutic dose injected in man, a bacteriostatic level of penicillin is maintained in the blood for 3–6 days, depending on the dosage and the individual response.

Seaman, A. & Woodbine, M. (1954). **The antibacterial activity of phenanthridine compounds.**—*Brit. J. Pharmacol.* **9**, 265-270. **201**

The authors collated data obtained by Brownlee *et al.* (1950), in the course of other studies, on the antibacterial activity of a series of 120 phenanthridine compounds, and showed that their antibacterial properties run roughly parallel with their trypanocidal properties. They found no indication that their modes of action on trypanosomes and bacteria are fundamentally different.—F.E.W.

Singh, G. B. & Rao, M. M. (1954). **Use of Dr. Frank's foetal extracter in reducing dislocation and overriding fractures in large animals.**—*Indian vet. J.* **30**, 352-353. **202**

A note on the use of the above instrument in setting certain fractures of bones in cattle.

—R. N. Mohan.

Westermarck, H. (1951). **[On the corrosive effect of certain disinfectants on surgical instruments.]**—*Finsk VetTidskr.* **57**, 41-43. **203**

Rust appears after 45 min. on instruments kept in chloramine diluted 1:100, after 50 min. in 1:1,000, and after about 10 hours in 1:10,000. Benzchloramine has the same effect. Various alkyl-ammonium compounds also have the same corrosive effect after about 2 hours in dilns. of 1:100 or 1:1,000 and in about 21 hours in dilns. of 1:10,000, whereas no corrosion occurs when sodium nitrate is added to solns. of 1:100–1:1,000. "Delegol" 1:100 and "dettol" (active constituents: chloroxylenol 3%, terpineol 12%) produce a black sediment in solns. in which instruments are kept.

See also abstr. **1-2** and **6** (antibiotics in mastitis); **3** (sodium and procain penicillin); **15-16** and **54** (*iso*-nicotinic acid hydrazide); **17** (inhibition of M. tuberculosis); **30** (effect of streptomycin on susceptibility to salmonella infection); **49** (quaternary ammonium compounds); **51** (cortisone); **59** (amoebacidal efficacy of antibiotics); **60** (ethidium bromide); **89-90** (inactivation of influenza virus by tannic acid); **113** (antibiotics in myxomatosis); **140** (piperazine citrate in A. lumbricoides infestation); **194** (toxaphene and D.D.T. poisoning in geese); **215** (penicillin in milk).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

CHAPMAN, R. E., MOULE, G. R. & RICHARDS, M. (1954). **Follicle groups in the skin of a mosaic Merino sheep.**—*Qd J. agric. Sci.* **11**, 37-42. **204**

A histological examination was made of skin from a sheep showing mosaicism in the fleece. The ratio of secondary to primary follicles in the area of skin growing long coarse wool was 10:1 and in the adjacent area growing typical Merino wool it was 17:1.

—M. H. HARDY.

BARER, G. R. (1954). **Quantitative measurements on spreading phenomena in skin.**—*Brit. J. Pharmacol.* **9**, 346-351. [Author's summary modified.] **205**

B. measured the pressure changes in the skin accompanying and following intradermal injections. When fluid is injected continuously at a constant rate the pressure reaches a plateau which varies with the rate of injection and not with the volume injected. He studied the effect of pressure on the action of hyaluronidase and the time relations of hyaluronidase action in rabbit skin. Spreading in skin with and without hyaluronidase was not significantly altered by preadministration of cortisone or salicylate. Changes in spreading properties of skin near local injections of cortisone were found to be due to the suspending medium.

CATELLANI, G. (1954). L'influenza dei diversi metodi di prelievo del midollo sternale nel bovino sulla percentuale degli emoistioblasti. **[Effect of different methods of obtaining samples of sternal bone marrow from cattle on the percentage of haemocytoblasts.]**—*Riv. Med. vet., Parma.* **6**, 97-102. [English, French and German summaries.] **206**

C. obtained samples of bone marrow from the sternum of 10 healthy cattle. The average number of haemocytoblasts in these samples was 24 per thousand cells when the method described by Marcato [*V.B.* **13**, 2224] was used and 8–10 per thousand cells when the method described by Romanelli [*V.B.* **24**, 3305] was used. C. attributed this discrepancy to the fact that by the first method smears were made from whole marrow, whereas by the latter method only the fluid part of the marrow was employed.—R.M.

ROSSI, G. (1953). Sul tasso ematico di granulociti eosinofili in suini sani di razza Large White. **[The eosinophile count in blood of healthy pigs.]**—*Ann. Fac. Med. vet. Pisa.* **6**, 110-119. [English and French summaries.] **207**

Blood smears of healthy castrated pigs showed 1·12% of granulocyte eosinophiles in males, 1·06% in females, the values for boars and sows being 4·9% and 5·57%. Eosinopenia in gelded pigs is probably due to hypertrophy of the adrenal cortex.—F. R. PAULSEN.

VAN DEN BERGHE, L. & BLITSTEIN, I. (1953). Etudes hématologiques chez des singes. I. Composition cytologique du sang. **[The blood picture of monkeys.]**—*Ann. Soc. belge Méd. trop.* **33**, 709-729. **208**

The authors recorded the results of haematological studies on 73 monkeys of different species, 8 chimpanzees and 2 orang-outangs, all of which were healthy.—D. POYNTER.

HARRISON, M. F. (1953). **Composition of the liver cell.**—*Proc. roy. Soc.* Ser. B. **141**, 203-216. **209**

H. determined the amounts of water, protein, glycogen, neutral lipoids, phospholipoids, ribonucleic acid, deoxynucleic acid, chloride, sodium, potassium, iron, copper and zinc in the fresh liver of male and female rats. From these values she calculated the amount of each substance in the individual liver cell. The main difference in chemical composition between cells from male and female rats was the iron content, which was 2–3 times greater in cells from females than in cells from males.—R.M.

CENNI, B. & FRATESCHI, T. L. (1953). Ricerche comparative sul coefficiente di flessione, il contenuto in ceneri, ecc. del metacarpiano principale negli equini. **[Study of the composition and strength of the metacarpal bone in young and adult horses.]**—*Ann. Fac. Med. vet. Pisa.* **6**, 38-51. [English and French summary.] **210**

Compared with the bones in the adult horse, the metacarpal bone of the young horse has a smaller specific gravity, lower ash content, less fat, and has a smaller mechanical strength. Conclusions were based upon physical, chemical and histological examinations.

—F. R. PAULSEN.

EISEN, V. D. & LEWIS, A. A. G. (1954). **Antidiuretic activity of human urine after surgical operation.** — *Lancet.* **267**, 361 - 364. [Authors' summary modified.] **211**

The authors tested urine passed by human patients in the 24 hours following surgical operations, for antidiuretic activity by i/v inj. into alcohol-anaesthetized rats and a dog suffer-

ing from diabetes insipidus. A large number of these urine specimens had antidiuretic activity in both species. Similar activity was detected in urine passed after stimulation of the supraoptico-hypophyseal system by nicotine and after the i/v inj. of pitressin into normal persons. Urine passed after moderate dehydration had no detectable antidiuretic activity.

The authors gave reasons for ascribing this activity to the presence of antidiuretic hormone (A.D.H.). They provided further evidence for the hypothesis that postoperative oliguria is due to the release of A.D.H.

ISIDOR, P. (1952). Recherches sur l'innervation végétative intramurale de l'utérus de la brebis. [**A study of the sympathetic nervous network of the uterus of the ewe.**]—*Rev. canad. Biol.* **11**, 195-220. [English summary.] **212**

The author described in detail sympathetic nerve fibres seen in sections of the uterus of the ewe. A silver nitrate method of staining was used.—R.M.

MEYER, H. (1954). **Macroscopic brain dissection in veterinary anatomy.**—*Amer. J. vet. Res.* **15**, 143-146. **213**

M. described a method used in Switzerland (Klingler, 1935). After fixation in 20% formol for 2–3 months, the brain is washed in tap water for 4–6 hours and frozen at 18° to 22°F. for 4–5 days. The tissues can readily be dissected after thawing. The freezing results in dissociation of the fibres and better differentiation of the grey from the white matter.—F.E.W.

SCHIRREN, C. G. (1951). Histologische Untersuchungen über die Struktur der Elastica in den Netzhautarterien des Rindes. [**Structure of the elastic tunic in arteries of the bovine retina.**]—*Anat. Anz.* **98**. 331-335. **214**

S. examined histologically arteries in the retina of the eyes of 12 young cattle. There was no elastic tunic in the walls of these arteries, and the whole thickness of the wall contained a network of elastic fibres, as in the retinal arteries of the human eye.—R.M.

See also absts. **149-150** (rumen temperature during feeding and fasting); **163-164** (passage of starch through the stomach of sheep and function of the omasum); **251** (chemistry of acid-fastness); **256** (haemoglobin standards); **260** (book, biochemistry of cancer); **262** (book, surgical physiology).

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

STORRS, F. C. & HIETT-BROWN, W. (1954). **The incidence of penicillin in milk supplies.**—*J. Dairy Res.* **21**, 337-341. [Authors' summary modified.] **215**

In surveys in the summer of 1951, 1·4% of churn milk contained penicillin in one group of tests and 2·8% in another. Bulk milk was free from this antibiotic. In a further survey in the winter of 1953, 3·2% of composite churn milk contained penicillin. Bulk milk was again free, but small aggregates of a few supplies used for making bulk starters for cheese production sometimes contained penicillin.

Of 20 samples of milk and 7 of whey examined during 1951-53, and which were implicated in starter failure, only two and one respectively contained penicillin in significant amounts.

In the composite milk of a herd containing 37 treated cows sufficient penicillin was present to cause inhibition of the starter up to the fifth milking.

ROSE, G. A. (1954). **Federal meat inspection in Canada.** — *Canad. J. comp. Med.* **18**, 207-212. **216**

Abattoirs whose products enter interprovincial or export trade must be under the supervision of the Federal Meat Inspection Service. Rigid standards of plant construction and equipment are maintained. Ante- and post-mortem inspections are conducted by veterinarians. All operations within the establishment are under the full-time supervision of veterinarians or qualified Meat Inspection Assistants.—THOMAS MOORE.

NORVAL, J. (1954). **Emergency slaughter of food animals.**—*R. sanit. Inst. J.* **74**, 674-682. [Author's summary modified.] **217**

N. gave a table showing the numbers of cattle, sheep and pigs slaughtered in emergency on account of accident or illness in Great Britain in the years 1948-52. He discussed the question of *ante-mortem* inspection, common findings, inspection and judgment of such animals, with particular reference to laboratory aids as used in Edinburgh.

ANON. (1954). **Food poisoning in England and Wales, 1951 and 1952.**—*Mon. Bull. Minist. Hlth Lab. Serv.* **13**, 12-24. **218**

An analysis of reports on food poisoning from medical officers of health and bacteriologists in England and Wales in 1951 and 1952 revealed that of 5,524 sporadic cases in the two years, 57% were due to salmonella infections and 43% to unknown causes.

—W. R. BETT.

BARNETT, S. A. & BATHARD, A. H. (1953). **Population dynamics of sewer rats.**—*J. Hyg., Camb.* **51**, 483-491. **219**

The authors calculated the number of rats in the sewers of 2 districts of London from the consumption by the rats of weighed amounts of food placed at selected points. Poisoning with baits containing sodium monofluoracetate or zinc phosphide reduced the number of rats by more than nine tenths, but the population increased almost to its previous size after 6 months.—R.M.

SANDERSON, N. V. (1954). **Veterinary aspects of preventive medicine in the Canadian Army.**—*Canad. J. comp. Med.* **18**, 177-183. **220**

Military veterinary responsibility includes meat, milk and food sanitation, communicable disease control, treatment and control of diseases of animals transmissible to man with reference to health of army personnel, evacuation and treatment of transport animals if employed, certain aspects of protection against atomic, biological and chemical warfare, and co-operation with the Federal Health of Animals Division under certain conditions.

—R. GWATKIN.

ANON. (1953). **Veterinary research centres in Africa south of the Sahara. III. Khartoum, Sudan.**—*Bull. epiz. Dis. Afr.* **1**, 334-343 & 345. [In English and French.] **221**

An outline of the history of the Veterinary Department of the Sudan since its formation as a military service in 1898 and a description of the present research laboratories—the main centre at Khartoum and the subsidiaries at Malakal and Nyala. Research is at present confined mainly to bovine contagious pleuropneumonia and the chemotherapy of trypanosomiasis in cattle. Details were given of the establishment and the present biological output of the department.—W. S. MARSHALL.

ROBERTSON, A. (1953). **Education in tropical veterinary medicine.**—*Vet. Rec.* **65**, 653-656. **222**

R. described arrangements under which a post-graduate course in tropical veterinary medicine, associated with a Diploma in Tropical Veterinary Medicine and Hygiene, was held annually at the Royal (Dick) Veterinary College, Edinburgh, from 1930 until the outbreak of the second world war. He emphasized the great need for recommencing such a course for field officers of the veterinary services of the Colonies, and discussed where it should be held, its duration and organization, and the curriculum. He recommended that the course should be held at Edinburgh and should last for two terms.—R.M.

See also absts. **121** (survival of *R. burneti* in dairy products); **265** (the Rhodesian Farmer, yearbook).

REPRODUCTION AND REPRODUCTIVE DISORDERS

BIELAŃSKI, W. (1954). Sztuczne unasienianie i zagadnienia płodności zwierząt w Bułgarii. **[Artificial insemination and sterility control in Bulgaria.]**—*Méd. vét., Varsovie.* **10**, 161-164. [In Polish.] **223**

The central A.I. Institute of Sofia serves 12 small A.I. Centres scattered throughout the country, with a veterinarian in charge of each. Lay inseminators are employed for insemination of cattle, sheep and goats, but insemination of mares is done exclusively by veterinarians. Each of the centres usually carries 2 males of each of the species. Artificial insemination of sheep and goats is a routine work in Bulgaria. As the centres have very little modern equipment and no refrigerators, collection of semen is done, in the peak period, 2–3 times a day. All animals inseminated are later examined for pregnancy. All the services are free to farmers.

From the table given, the scheme appears to be working very satisfactorily. For the dilution of semen, cow's milk has been introduced; for the dilution of stallion semen, honey has been found more suitable than glucose.

In the last few years special work has been done on the problem of sterility.

—J. R. MITCHELL.

BLACKSHAW, A. W. (1954). **A bipolar rectal electrode for the electrical production of ejaculation in sheep.**—*Aust. vet. J.* **30**, 249-250. [Author's summary modified.] **224**

B. described a cheap portable stimulator, using a simple bipolar rectal electrode for the electrical ejaculation of rams. Results are as good as those obtained with a single rectal pole and external lumbar pole, while less discomfort is caused to the ram.

OLSEN, M. W. (1952). **Intra-ovarian insemination in the domestic fowl.**—*J. exp. Zool.* **119**, 461-481. [Author's summary slightly modified.] **225**

Spermatozoa when applied directly to the surface of the ovaries of 4- to 17-week-old chickens are, in some instances, able to pene-

trate the follicular wall and enter the ovum.

In some preparations follicles containing cell groups simulating holoblastic cleavages were found. In no instance were mitotic figures observed. Four new-laid eggs, apparently fertile, were obtained from hens as long as 5–6 months after spermatozoa had been applied to their ovaries. Other eggs were found in which none of the degenerative changes usual in infertile eggs had occurred in the protoplasmic disc at the time of laying.

SMITH, J. T., MAYER, D. T. & HERMAN, H. A. (1953). **Osmotic pressure of extended bovine semen during storage.**—*Res. Bull. Mo. agric. Exp. Sta.* No. 538. pp. 20. [Authors' abst. modified.] **226**

Semen from dairy bulls was diluted with diluents used in the practice of artificial insemination and with diluents especially designed to alter one or more of the physical and chemical properties. These diluted samples were stored at 4° to 7°C. and evaluated daily for motility and osmotic pressure. Motility was measured by a standard method. Osmotic pressure was determined with a modification of the Hill-Baldes thermo-electric osmometer and expressed in terms of freezing point depression. Results showed that osmotic relationships are important in preparing diluents. The diluents which maintained osmotic pressure within the limits of −0·44° to −0·61°C. (freezing point depression) were superior in the maintenance of motility during a 10-day storage period.

Glucose in the diluent aids in maintenance of osmotic pressure within narrow limits during storage. When antibiotics were added to a diluent there was a rise in osmotic pressure during the first 48 hours of storage, but maintenance of osmotic pressure was at a slightly lower level than that obtained with the same diluent without antibiotics. If the diluting medium without antibiotics maintained osmotic pressure within the optimal range, addition of antibiotics did not change the osmotic pressure to the extent that it was no longer within the optimal range.

BRÜGGEMANN, J., BRONSCH, K., DREPPER, K. & SCHOLE, J. (1954). Beiträge zur Biochemie von Sperma und Eizelle. I. Zur Kenntnis der chemischen Zusammensetzung und einiger physikalischer Konstanten des Ejakulats, Samenblasensekrets und Vaginalschleims von Rindern. **[Biochemistry of semen and ova. I. Chemical composition and some physical constants of the ejaculate, seminal vesicle secretion, and vaginal mucus of cattle.]**—*Fortpflanzung.* **4**, 111-114 & 121-123. [English summary.] **227**

The authors analyzed the semen and seminal vesicle secretion (in summer and in winter) of 10–20 bulls, and the vaginal mucus of 30 cows during oestrus, all belonging to the Spotted Mountain breed. They gave figures for the following constituents and physical properties:—ash, protein, nitrogen, phosphorus, calcium, magnesium, chlorine, vitamin B_1, nicotinic acid, vitamin C, tryptophane, specific gravity, pH, osmotic pressure, viscosity, and surface tension.—R.M.

SCHINCKEL, P. G. (1954). **The effect of the presence of the ram on the ovarian activity of the ewe.** — *Aust. J. agric. Res.* **5**, 465-469. **228**

Rams were introduced into a group of 36 Merino ewes near the beginning of the breeding season. A similar group of 36 ewes was used as control. Ewes of the first group were killed 6 days after introduction of the rams; control ewes were slaughtered at about the same times. Their ovaries were serially sectioned.

The number of animals that were found to have ovulated more than 6 days before slaughter was similar in the two groups, but the number that had ovulated during the 6 days before slaughter was much higher in the mated group than in the control group. S. concluded that the introduction of the rams stimulated ovulation without oestrus ("silent heat") in the majority of the ewes in which cyclic ovarian activity had not already begun, and that this is the probable mechanism of the "lag and peak" incidence of oestrus previously observed under similar conditions [Underwood *et al.* (1944); Thompson & Schinckel (*V.B.* **22**, 3217)].

—A. W. H. BRADEN.

PARKES, A. S. & SMITH, A. U. (1953). **Regeneration of rat ovarian tissue grafted after exposure to low temperatures.**—*Proc. roy Soc.* Ser. B. **140**, 455-470. [Authors' summary slightly modified.] **229**

The authors studied the viability of rat ovarian tissue after exposure to −79°C. and to −190°C. for varying times and in different media. Tissue so treated was grafted, usually autoplastically, into spayed rats and its functional activity assessed by examination of vaginal cycle and by histological studies at intervals after grafting.

Ovaries chopped in serum; cooled slowly to −79°C. and kept at that temp. for one hour or for 9 days gave functional autografts, but not

after exposure to −190°C. The incidence of "takes" and the functional activity of the grafts was greater when the ovarian tissue was suspended in serum or saline containing 15% glycerol and cooled either to −79° or to −190°C. for one hour. Such material deteriorated during 9 days at −79°C. but not at −190°C. A delay of 2 hours between thawing and grafting reduced the incidence of "takes" with ovarian tissue suspended in saline containing 15% glycerol and cooled to −190°C. Increasing the conc. of glycerol in the medium to 25% before freezing also decreased the proportion of "takes" and delayed the appearance of activity of the grafts. Material cooled rapidly did not give functional grafts.

The histological appearances suggested that, during the processes of freezing and thawing, a proportion of ovarian cells were destroyed and that eggs in all stages of development were particularly sensitive. Immature ovarian tissue had a greater capacity for re-formation of oocytes than had adult tissue, but in either case the capacity to re-form oocytes was exhausted within one month, whereas lutein tissue continued to increase for several months.

FRANKLIN, K. J. & WINSTONE, N. E. (1954). **Further notes on parturition in the rabbit.**—*J. Physiol.* **125**, 43-50. [Abst. from authors' summary.] **230**

The authors described and illustrated the anatomy of the birth canal in the rabbit and related function in certain aspects to structure. They described the normal stance of the doe during parturition, detailed its components, and noted its purposive character. They described arterial blood pressure changes occurring before, during, and after spontaneous or oxytocin-induced parturition in anaesthetized does and reproduced portions of tracings.

TYRRELL, D. A. J., TAMM, I., FORSSMAN, O. C. & HORSFALL, F. L., JR. (1954). **A new count of allantoic cells of the 10-day chick embryo.**—*Proc. Soc. exp. Biol., N.Y.* **86**, 594-598. [Abst. from authors' summary.] **231**

The authors estimated by direct counting with the phase-contrast microscope the mean number of allantoic cells per sq. cm. of the allantoic membrane in 10-day-old chick embryos. In the chorionic (CA) portion there were $1{\cdot}66 \times 10^5$, and in the amnion-yolk sac (AYA) portion $3{\cdot}00 \times 10^5$ allantoic cells per sq. cm. The estimated mean total area of the allantoic membrane was 87 sq. cm., that of the CA portion being 57·9 sq. cm., that of the AYA portion 29·1 sq. cm. The number of cells lining the allantoic cavity was estimated to be $1{\cdot}8 \times 10^7$.

HEIDRICH, H. J. (1954). Zur Therapie der symptomlosen puerperalen Agalaktie und Hypogalaktie. **[Treatment of puerperal agalactia and diminution of milk yield in cows.]**—*Berl. Münch. tierärztl. Wschr.* **67**, 215-217. [English summary.] **232**

H. described the homoeopathic treatment of absence of milk or diminution of milk yield in a small number of otherwise normal newly-calved cows. He claimed good results for the treatment.—R.M.

BOGUTH, W. & RIECK, G. W. (1953). Papierelektrophoretische Untersuchungen von Blutserum bei der hyperplastischen Endometritis und Pyometra der Hündin. **[Electrophoretic study of blood serum in the diagnosis of endometritis and pyometra in dogs.]**—*Berl. Münch. tierärztl. Wschr.* **66**, 3-6. **233**

The authors examined by electrophoresis the serum of 5 bitches with hyperplastic endometritis, 5 with pyometra, and one normally pregnant bitch. They observed that the proportion of α-, β-, and γ-globulins differed from the normal and was sufficiently characteristic for each of the above conditions to enable electrophoresis to be used as a means of diagnosis.—R.M.

ŠERT, Ž. (1953). Prilog terapiji iznurenih konja transplantacijom testesa mladih pastuha. **["Rejuvenation" of aged mares by implantation into the neck of testicular tissue from young stallions.]**—*Veterinaria, Sarajevo.* **2**, 625-629. [In Croat. Abst. from English summary.] **234**

The author implanted testicular tissue from a young stallion under the skin of the neck in 4 mares, aged 15–20 years. He observed an increase in body wt., vitality, and working ability; these improvements lasted for at least a year after the operation.—R.M.

VARADIN, M. (1953). Izazivanje superovulacije kod ovaca primjenom seruma ždrebnih kobila. **[Superovulation in sheep induced by pregnant mares' serum.]**—*Veterinaria, Sarajevo.* **2**, 650-661. [In Croat. Abst. from English summary.] **235**

The author induced ovulation in 242 ewes by administering different preparations and varying doses of pregnant mares' serum. The ewes were subsequently inseminated artificially. The most satisfactory preparation, as judged by

the number of lambs produced and by the absence of dead lambs, was one containing follicle stimulating hormone and luteinizing hormone in the ratio of 160:1. He recommended that one third of a flock of Tsigai ewes thus treated should be inseminated with Karakul semen. The offspring of these ewes would be slaughtered at birth for their wool, so that surplus lambs from the remaining two thirds of the flock could be transferred to them.—R.M.

BRADEN, A. W. H. & PETERSON, J. E. (1953). **The persistence of endometrial cysts induced by oestrogen in guinea pigs.**—*Aust. J. biol. Sci.* **6**, 520-532. **236**

Cystic glandular hyperplasia of the endometrium was induced in ovarectomized and entire g. pigs by injecting i/m 5 μg. oestradiol benzoate three times a week for 7–8 weeks, or by feeding them oestrogenically active subterranean clover for 7–8 weeks. The condition persisted for long periods after the cessation of oestrogen treatment, although normal oestrous cycles still occurred in entire g. pigs which were not subjected to biopsy consisting of the removal of one horn of the uterus.

A complicating factor was the finding that the removal of one horn of the uterus caused cystic endometrial hyperplasia in most of the untreated g. pigs, yet the same procedure caused cystic endometrial hyperplasia in a considerably smaller proportion of animals treated with oestradiol and in none of those fed clover.

—A. W. BLACKSHAW.

BURKHARDT, J. (1954). **Treatment of anoestrus in the mare by uterine irrigation.**—*Vet. Rec.* **66**, 375-376. **237**

With the exception of stilboestrol dipropionate in 8–10 mg. doses, hormone treatment of anoestrus in mares is unreliable. Irrigations of the uterus with a quart of normal saline or boiled water (temperature about 106°F.) with 15 grains of quinosol (the potassium salt of oxyquinoline-sulphonic acid) give satisfactory results. B. described the technique.

—W. R. BETT.

KENDRICK, J. W. (1954). **Psychic impotence in bulls.**—*Cornell Vet.* **44**, 289-293. [Author's summary modified.] **238**

An account of an impotence, similar to psychogenic impotence of man, in 3 bulls. The condition in a Hereford bull apparently caused by an injury was relieved by effecting a single coitus with the artificial vagina. Two dairy bulls in artificial service regained normal coital ability following resection of the retractor penis muscle.

KAMPELMACHER, E. H. (1954). Een orienterend onderzoek omtrent de microbiologie en histologie van de uterus bij onvruchtbare runderen met behulp van een biopsie-apparaat. [**A preliminary study of the microbiology and histology of the uterus in sterile cattle, using a biopsy apparatus.**] — *Thesis, Utrecht.* pp. 128. [English, French, German and Spanish summaries.] **239**

Biopsy samples for bacteriological and histological examination of the uterine mucosa were taken from 81 cows. Of the 45 cases that were bacteriologically positive, 22 yielded cultures of micrococci. According to serological findings the presence of these organisms appears to be a secondary infection following brucella or vibrio infection.

Both bacteriological and histological examinations are necessary for a correct diagnosis: the diagnosis was positive according to both methods only in 64%.—C. A. VAN DORSSEN.

WEBER, F. & LÖRTSCHER, H. (1954). **Concerning the influence of environment on the fertility of White Leghorn cocks (S.C.W.) of different origin.**—*Papers presented to Xth World's Poult. Congr.*, Edinburgh, 1954. pp. 37-41. [English and French summaries: pp. 7-8 of Summaries of Section Papers.] **240**

The authors reported that crossbred cockerels, with a high degree of heterozygosity, were able to maintain normal fertility rates over a wide range of temperature, whereas the fertility of purebred cockerels showed marked fluctuations.—E. A. GIBSON.

LUCAS, D. R. (1954). **Ocular associations of dappling in the coat colour of dogs.**—*J. comp. Path.* **64**, 260-266. [Author's conclusions modified.] **241**

L. gave a clinical and histological account of the eyes of a "white" dachshund—an animal homozygous for dappling. There was microphthalmos and general hypoplasia of the uveal tract associated with minimal developmental aberrations which had probably arisen during closure of the foetal cleft.

He also studied some new-born Great Dane puppies, which were not readily distinguishable into types, including some apparently normal, some heterozygous for the harlequin pattern and some homozygous for it (these latter corresponding to the "white" dachshund). A tapetum lucidum was present in the normal puppies, but lacking or hypoplastic in the homozygotes while in the heterozygotes the choroid itself was hypoplastic.

SCHUMANN, H. (1954). Erbliche Anomalien der

Zehen beim Haushuhn. **[Hereditary anomalies of the toes in fowls.]**—*Berl. Münch. tierärztl. Wschr.* **67,** 237-240. **242**

An account of syndactylism, polydactylism, brachidactylism, dactylosis (scleroderma with fissuring of the skin), crooked toes and claw deformities.—R.M.

INNES, J. R. M. (1952). **The cerebellum and cerebellar ataxias.**—*N. Amer. Vet.* **33,** 694-696. **243**

Cerebellar defects give rise to various types of asynergia including disturbances of balance, posture and locomotion and muscular weakness and tremors. The author mentioned cerebellar atrophy in new-born lambs and Hereford calves; in these animals congenital cerebellar disease is manifested at birth by which time the cerebellum is normally well-developed, but in kittens and puppies signs of cerebellar disease might not appear until walking began.

—J. E. SMITH.

MORLEY, F. H. W. (1954). **A new lethal factor in Australian Merino sheep.**—*Aust. vet. J.* **30,** 237-240. [Author's summary modified.] **244**

M. described a deformity termed "lethal myodystrophia" in Merino sheep. The condition is apparently determined by an autosomal recessive gene.

KENNETH, J. H. & RITCHIE, G. R. (1953). **Gestation periods. A table and bibliography.**—*Tech. Comm. Com. Bur. Anim. Breed. Genet.* No. 5. pp. 39. 3rd Edit. **245**

A list of the gestation periods of some 340 species of wild and domesticated mammals. The gestation periods of the breeds of each domesticated species were also given. The source of the figures quoted appears in the bibliography of 600 references.—R.M.

I. DONALD, H. P. (1953). **A study of variation in twin cattle. I. General description.**—*J. Dairy Res.* **20,** 355-360. **246**

II. DONALD, H. P. & ANDERSON, D. (1953). **A study of variation in twin cattle. II. Fertility.**—*Ibid.* 361-369. **247**

I. In a uniformity trial, the rearing and milking performance of 15 pairs of one-egg twin heifers were compared with those of an equal number of pairs of two-egg twins and half sibs. The trial was designed to indicate the statistical efficiency of the 3 types of pairs relative to each other, the heritability of various characters, and the sources of variation within pairs. The husbandry régime followed normal farm routine except that the level of nutrition was intentionally higher than normal and individually weighed rations were fed according to body weight and, after calving, to milk production.

II. Intra-pair variance in age at the first observed oestrus and in the gestation period was less for the one-egg twins than for the other pairs, but not significantly so. No genetic variation and no individuality could be detected in the interval between oestrous periods or in the number of services per conception. Only one set of two-egg twins occurred in 122 pregnancies of one-egg cows mated with one-egg bulls whilst no twins were obtained from 60 pregnancies of two-egg cows mated with one-egg bulls. In two other pregnancies of one-egg cows, following therapy with luteinizing hormone, twins resulted.

—A. ACKROYD.

See also absts. **154** (embryonic malformations caused by dietary deficiencies); **160** (post-parturient haemoglobinuria of dairy cows); **212** (sympathetic nervous network of the ovine uterus).

ZOOTECHNY

KRAYBILL, H. F., HINER, R. L. & FARNWORTH, V. M. (1954). **The relation of organ weight to lean body mass and empty body weight in cattle.**—*J. Anim. Sci.* **13,** 548-555. [Authors' summary slightly modified.] **248**

Data on 165 cattle have been studied statistically to determine the degree of association between the weights of the visceral organs, spleen, liver, heart, kidney and pancreas, and the weight of lean-body mass and empty-body weight. These organs were also evaluated as indicators in the estimation of empty-body weight and lean-body mass in cattle.

There is a very high positive correlation between the organ weights and the weights of the empty-body and the lean-body mass. All visceral organs studied were about equally reliable in their predictive value. For a population of cattle limited in age and weight, the liver appears to be a better indicator than the other organs. With a group of cattle varying more widely in age, weight and degree of fatness, all organs are good indicators. The hypothesis that liver is uniquely related to lean-body mass is invalidated since other organs are also highly correlated with this factor and because this relationship is influenced largely by total or empty-body weight.

MORLEY, F. H. W. (1954). **Selection for economic characters in Australian Merino sheep. IV. The effect of inbreeding.**—*Aust. J. agric.*

Res. **5**, 305-316. [For part III, see *V.B.* **24**, 939.] **249**

In a population which is under selection the effect of percentage of inbreeding on the expression of a character is underestimated by a simple regression model, because females with the best phenotypes tend to be most closely related to the sires which are more highly selected than the dams. Thus a positive correlation occurs between the phenotype of dam and inbreeding of offspring. This correlation was shown to exist for a number of characters in Merino sheep except where either no selection had taken place or it had been offset by a negative genetic correlation with another character under strong selection.

M. proposed a multiple regression model taking account of both inbreeding and offspring and phenotype of dam. This would limit estimation of inbreeding effects to data where records of dams are also available. When this model was applied to the Merino data, the following partial regression coefficients (significant at the 1% level) on percentage of inbreeding were obtained:—Greasy fleece wt., 0·064 lb.; clean fleece wt., 0·044 lb.; body wt., 0·291 lb.; fold score, 0·044 units.

The coefficients for yield, staple length, crimps per inch, and birthcoat grading were not significant. As increased inbreeding was associated with decreased survival, the above regression might still underestimate the true effects. The effects on economic characters in the Merino are considerable and, therefore, should be taken into account when assessing alternative breeding plans which will result in differing amounts of inbreeding.

The analyses also yielded estimates of heritability. These were generally high, confirming earlier figures.—A. A. Dunlop.

Pease, M. (1952). **Sex-linkage in poultry breeding.**—*Bull. Minist. Agric., Lond.* No. 38. pp. 11. London: H.M. Stat. Off. 3s. 0d. **250**

P. described sex-linked characters in fowls, illustrating some of them in 4 coloured plates. He discussed the choice of cross-bred or pure-bred fowls, and, briefly, the existence of sex-linked characters in ducks.—R.M.

TECHNIQUE AND APPARATUS

Berg, J. W. (1953). **Chemistry of acid-fastness.**—*Proc. Soc. exp. Biol., N.Y.* **84**, 196-198. **251**

Using a chloroform-water partition technique B. studied the combination of crystal violet with mycolic and leprosinic acid. A 1:1 complex was formed which was soluble in xylol, unlike the dye alone. A strong absorption peak at 3500 Å was found in the complex which was present in neither the dye nor the acids. No other acid-fast dyes showed the peak at 3500 Å. Blocking of hydroxyl and carboxyl groups prevented the characteristic reaction.
—J. M. Leach.

I. Samuel, E. P. (1953). **Impregnation and development in silver staining.**—*J. Anat., Lond.* **87**, 268-277. **252**

II. Samuel, E. P. (1953). **The mechanism of silver staining.**—*Ibid.* 2782-87. **253**

I. Paraffin sections of nervous tissue were impregnated with silver under varying conditions of time, temperature, silver concentration, and pH. At high pH, sections had an undifferentiated appearance. S. described the effect of different developers.

II. In silver staining of nervous tissue, some minute silver "nuclei" are probably reduced by the tissues: other silver is reduced by the developer. The amount and distribution of the two varieties depends on the properties of the section, silver concentration and pH of solution, and the time and temperature of treatment.—S. E. Fox.

Arnold, J. S., Taysum, D. H. & Jee, W. S. S. (1954). **Apparatus for bone sectioning.**—*Stain Tech.* **29**, 55-58. **254**

An account of an apparatus for cutting 100–200 μ bone sections. A circular saw with three-directional movement controls driven by a direct current motor is used, the bone being held in a special vice.—D. Poynter.

Kropp, B. N. (1954). **Grinding thin sections of plastic-embedded bone.**—*Stain Tech.* **29**, 77-80. **255**

An account of an adapted metallurgical technique whereby dry, calcified bone is simultaneously infiltrated, embedded in an acrylic resin and then ground to the desired thinness for microscopic observation with transmitted light.—D. Poynter.

Poole, J. C. F. (1954). **Haemoglobin standard.**—*Lancet.* **267**, 116-117. [Author's summary modified.] **256**

P. suggested, on the basis of evidence collected from published reports, that the British Standards Institution Haldane haemoglobin col-

our standard should be valued at 14·5 g. of haemoglobin per 100 ml. of blood instead of 14·8 g. per 100 ml. as had previously been customary.

RINALDINI, L. M. (1954). **A quantitative method for growing animal cells** *in vitro*.—*Nature, Lond.* **173,** 1134-1135. **257**

The technique described, based on freeing cells from tissues with trypsin, gives a good rate of growth and yields an even suspension of viable cells, suitable for counting, chemical analysis and further cultivation.—D. POYNTER.

ANON. (1954). **[Portable X-ray.]**—*Science.* **119,** 676. **258**

Radio-active thulium is mounted in a source holder and shield equipped with a shutter mechanism. Rays produced compare in energy to those supplied by a 100 kv machine. No electrical power is needed.—D. POYNTER.

See also absts. **37** (yolk sac technique for isolation of brucella); **74** (dye test for Toxoplasma and Sarcocystis infections); **92** (monolayer tissue cultures); **224** (rectal electrode for ejaculation in rams); **239** (a biopsy apparatus for examinations of the uterus in sterility); **262** (book, experimental surgery).

REPORTS

INDIA, PUNJAB. (1953). **Annual report of the Civil Veterinary Department, Punjab (India) for the year 1951-52.** [AGGARWALA, A. C.] pp. 131. Chandigarh, Punjab: Controller of Printing and Stationery. **259**

RINDERPEST occurred in 237 bovines, of which 110 died, HAEMORRHAGIC SEPTICAEMIA in 3,961, of which 3,809 died. BLACKLEG accounted for 236 deaths, and ANTHRAX for only one. SURRA occurred in 534 equines and 73 camels, of which 21 equines and one camel died. There were 33,970 cases of F. & M. DISEASE. Only one outbreak of NEWCASTLE DISEASE was recorded.

The Department's 193 hospitals and dispensaries treated 138,968 animals. The Department had 205 Veterinary Assistant Surgeons, besides other staff. The Veterinary College had 77 students and turned out 9 graduates.

Animals slaughtered were 46,469 sheep, 290,403 goats and 3,555 pigs; but no cattle or buffaloes. Bovines castrated were 326,742.

On Government Livestock Farm, Hissar, the breeding policy aimed at putting more milk in the 'dual-purpose' Hariana cattle without undermining 'draught-ability', and some cows attained 3000-4000 lb. lactation yield.

—R. N. MOHAN.

BOOK REVIEWS

GREENSTEIN, J. P. [Chief, Laboratory of Biochemistry, National Cancer Institute, National Institutes of Health, United States Public Health Service, Bethesda, Maryland.] (1954). **Biochemistry of cancer.** pp. xiii + 653. New York: Academic Press, Inc.; (London: Academic Books, Ltd.) 2nd Edit., revised and enlarged. $12.00. **260**

This book is essentially a critical, exhaustive, and particularly lucid review of important aspects of current knowledge and trends in the field of biochemistry applied to cancer research. The various chapters fall into three main groups. The first group deals with the induction of tumours, and includes discussions of extrinsic carcinogenic factors and their effects on the experimental animal, the relationship of chemical structure to carcinogenesis, and intrinsic factors, especially hormones. The second group deals with attempts to influence the induction and growth of experimental tumours, by such means as dietary deficiencies, endocrine injection and ablation techniques, and chemotherapy. The third group is concerned with the chemistry and biochemistry of the tumour and of the tumour-bearing host. In regard to the latter, particular attention is paid to the observed decrease of liver catalase, and the "toxic" action of the tumour.

It is clear that, of the disciplines that will contribute to the final elucidation of the cancer problem, biochemistry occupies a chief, if not the first, place, and this book gives an exciting picture of the progress already being made.

—E. COTCHIN.

ANON. (1952). **The work of Sir Robert McCarrison.** [Edited by: SINCLAIR, H. M.] pp. lviii + 327. London: Faber & Faber, Ltd. 30s. **261**

This book of seven chapters describes the work of Sir Robert McCarrison on nutrition problems of India, at Coonoor Nutrition Research Laboratories of which he was the first Director. There is a prologue on three essays, one by W. R. Aykroyd who succeeded Sir Robert, and two others by specialists on nutrition, E. V. McCullum and H. M. Sinclair. The book is concerned mainly with human nutrition and covers for example goitre and cretinism, studies in deficiency diseases and aspects of faulty nutrition in India. There

are some 159 references to literature and an index.—E. MARSH JONES.

MARKOWITZ, J. [Associate Professor of Pysiology, University of Toronto, Visiting Professor of Physiology, Ontario Veterinary College, Guelph, Ont.] (1954). **Experimental surgery including surgical physiology.** pp. xii + 851. London: Baillière, Tindall & Cox. 3rd Edit. 76s. 6d. **262**

The second edition of this book was reviewed in this Bulletin four years ago [*V.B.* **20,** 544]. In preparing this third edition the author has had the collaboration of two veterinarians, Dr. J. Archibald and Dr. H. G. Downie of the Ontario Veterinary College. All chapters have been extensively revised and much new material added; indeed, the number of pages has increased by more than three hundred. This edition can be recommended without reserve to all veterinary surgeons. It is an essential book for physiologists.

—ALFRED T. COWIE.

WOOLDRIDGE, W. R. [Scientific Director of the Animal Health Trust.] (1954). **Farm animals in health and disease.** pp. xvi + 463. London: Crosby Lockwood & Son, Ltd. 30. **263**

The author wrote this book to help the keeper of livestock to acquire knowledge of the health problems of his animals, in order that he may approach his task of rearing and maintaining the health of livestock with greater understanding and profit.

The subject matter is divided into two parts. Part I contains five chapters dealing with the control of disease in general and legislative measures concerning it, the economic aspect of loss resulting from disease, and future trends in livestock health. Other subjects included here are pasture management, plant poisoning, nutrition, methods of diagnosis, breeding, and hygiene.

In Part Two the diseases of horses, cattle, sheep, goats, pigs, rabbits and poultry are concisely described in separate chapters. Cattle receive the greatest attention (94 pages), and next come horses, sheep, pigs, and fowls with about 40 pages each. There are many excellent and original photographs. The book is written in a clear style and makes interesting reading; excessive or undesirable oversimplification of the language used is avoided.

—R.M.

HUNGERFORD, T. G. [Director, Veterinary Health Services, Penrith, N.S.W.] (1953). **Diseases of livestock.** pp. 660. Sydney, N.S.W.: Grahame Book Co. 3rd Edit. 65s. **264**

There can be no doubt that this is a good book. As the preface points out the book is intended for farmers who do not have ready access to a veterinary service. The whole field of livestock disease is covered very thoroughly. All domestic species except poultry are dealt with and most of the diseases which affect them, commonly or uncommonly, receive some attention. A common fault of books of this type is to fall between the satisfactory points of farmer education and textbook standard. This book overcomes this problem largely by confining itself to a high standard of farmer education, eliminating unnecessary scientific presentation and discussion, but presenting sufficient basic information to enable a lay reader to understand the fundamentals of each disease process and to stimulate the interest of the better informed readers. It avoids being completely empirical by this means and is better for it. If all stock-owners were educated to the level of this book the task of the veterinarian would be made so much easier.

The presentation of the text is good but the many illustrations are, for the most part, of a very poor standard. Considerable improvement could be achieved by the use of better paper for the photographs which are an extremely important part of the book. The text itself is accurate and up-to-date, suffering only slightly from the inclusion of some old-fashioned remedies of doubtful value.

—D. C. BLOOD.

ANON. (1953). FEDERATION OF RHODESIA AND NYASALAND. **The Rhodesian farmer. Year Book.** pp. 262. Salisbury: Rhodesian Printing and Publishing Co. Ltd. 21s. **265**

This is the first farmers' yearbook to be produced for the Federation, and it covers every aspect of the farming life of the territory. There are good photographs of the outstanding types of livestock produced.

The work of the Veterinary Department is mentioned in the general introductory survey, and a review of stock diseases is contributed by the Director of Veterinary Services. There is a short explanatory and advisory article on tsetse flies and trypanosomiasis. Of general interest to veterinarians working in Africa are the articles on Native Agriculture and indigenous cattle.—R. G. MARES.

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